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An Address

By

VICE-ADMIRAL SIR GEOFFREY THISTLETON-SMITH, K.B.E., C.B., G.M.

ADMIRAL KERN, members of the Association of Military Surgeons of the United States of America, fellow guests.

First, I want to thank you and your Council personally for inviting me—the Royal Navy's representative here in the United States—to meet this unique gathering of eminent doctors. Unique because nowhere else could one encounter a more cosmopolitan assembly of professional men and women whose primary interest it is to discuss the practice and advancement of military medicine.

I want to thank you and the Association on behalf of all your guests for your invitation to join your Annual Convention and see something of your many and various medical activities and for your very generous hospitality, in particular the kind thought behind this international luncheon which enables us to meet each other under such pleasant conditions.

This hospitality and all the work and care that has gone into the preparation of this convention is in fact no more than I would have expected from the medical branches of the United States Services, of whom I have formed the very highest regard while I have been here in Washington.

Admittedly, and perhaps fortunately, I have not had much personal experience of the application of the medical art during my time here; but, in a job like mine I see and hear a lot, and all of that is very much to the credit of those Services. Their thoroughness and progressiveness, their confidence in themselves and their pride of work has impressed me very much; qualities which seem to permeate down through all grades of officer and enlisted man.

What personal knowledge I have is confined to the domain in the Main Navy Building where Captain Burkley and his colleagues deal with something like a thousand patients a day regardless of color, sex, age or creed. Many of us in the foreign services here in Washington can be grateful to that remarkable organization and the invariable courtesy, efficiency and cheerfulness which is shown by all to all. Admiral Kenney, I welcome this opportunity of expressing my thoughts on this matter, my admiration and my thanks.

In my early days at sea we got along with relatively small medical staffs. In our battleships maybe you would find two, in cruisers probably only one doctor, and in the smaller ships none at all, and they did not appear to be overworked. They were nice fellows, very useful in the wardroom taking on odd jobs such as the organization of games, or theatricals, always ready for a game of bridge and spending long hours on matters connected with the supply of wine and spirits. The fact is that in times of peace we all led much more normal lives in those spacious days and were correspondingly

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Official Admiralty Photo

VICE-ADM. G. THISTLETON-SMITH

more healthy I think. (In War, of course, it was a different matter.) Nowadays working and living with our ever more complicated and concentrated weapon systems, whether these systems are on the sea, or under the sea, or in the air, becomes much more of a problem, in the solution of which advanced medical knowledge is an increasingly important factor.

The good health and morale of the fighting service man has of course always been vitally important. The commander who has forgotten that has usually come a cropper. The British Army under General Wolfe that besieged Quebec in 1759 was well found and led; their casualties in the crucial battle on the Heights of Abraham amounted to a mere handful of men, but in the following winter, with victory won, the same British force quartered in the city of Quebec lost over half its men through disease and malnutrition without the enemy lifting a finger. Our great leaders in the past were well aware of this. Admiral Lord Nelson, whose victory of Trafalgar we in the Commonwealth Navies were commemorating a few days ago, took infinite care over the health and morale of his ships' companies. This is borne out fully in some of his letters. Of particular interest are those he wrote during the two years before Trafalgar when he was continuously at sea with the Fleet. In March 1804 he wrote to an old friend, Dr. Moseley, "The great thing in all military service is health, and you will agree with me that it is easier for an officer to keep men healthy than for a physician to cure them"; and later in the same letter "I have, by changing the cruising ground not allowed the sameness of prospect to satiate the mind." About the same time he wrote to another doctor "Bear in mind not to be penny wise and pound foolish—a small sum well laid out will keep the Fleets healthy, but it requires large sums to make a sickly Fleet healthy."

There have been tremendous changes in the last one hundred and fifty-five years, but what Nelson wrote then is just as true today. The problems are much the same but infinitely more difficult to lick in some respects. On the same day that we were commemorating the death of Lord Nelson and his victory at Trafalgar, our Queen Elizabeth launched our first nuclear-powered submarine at Barrow-in-Furness in England. The operation of this ship has required the solution of many new and complicated medical problems. She will have a crew of some ninety officers and men; among them will be a medical officer and three experienced medical staff technicians. Their time will be largely taken up not so much with ordinary medical duties as we have envisaged these in the past, but with the control of the radiation environment of the crew and of the many environmental factors which must be considered when men have to live within this complicated weapon system for days and weeks on end. We have to cope with similar complexities in the air and in modern land operations.

To-day we in the military are changing our environment and we are asking for much from our medical advisers.

There are other troubles. In the old days we led vigorous lives—"March like the in-

fantry, ride like the cavalry," and all that—with insufficient nutrition. Now we take no exercise; nobody thinks of marching or riding these days—and we eat too much! There is a real danger of our military forces going soft in the way of life many of us enjoy today, a softness which is not likely to be found in our enemies.

There is no doubt in my mind, nor I am sure in the mind of any thinking service officer, that we are now immensely dependent on a significant contribution to medical progress in our military thinking, a progress which can only come from our medical advisers, in the civilian, as well as in the military, field: it calls for a great effort and a joint effort. We must pool our efforts and help each other. Gone are the days of the Service doctor having time on his hands. He now stands at the right hand of the commander. I am sure this is a challenge which our medical people will meet and I am equally sure this convention will do much to further that endeavor.

CITIZENSHIP . . .

The freedom we Americans enjoy—the cornerstone of our government, the foundation of our way of life—is our most precious possession—and our most costly one. We must remember that it is ours today only because of long centuries of courage and devotion, of toil and sacrifice, of struggle and achievement on the part of countless millions of men and women. And we must remember, too, that it will continue to be ours only so long as the members of each succeeding generation of citizens faithfully nourish it, and valiantly defend it, not only against attack by enemies from without, but against such deadly adversaries as neglect of civic duty, indifference to wrong, disregard of right, and the twin evils of blind prejudice and intolerance.

"Responsibility" is the key word. Our American citizenship is far more than a legal status, or a source of rights and privileges. First and foremost it is a responsibility—a grave but magnificent personal responsibility for the well-being of a great nation and the preservation of the human values which make it great and strong.

It is a responsibility which a citizen may, to his shame, neglect, but which he can never escape.

In the long run we as citizens, and we alone, can determine the destiny of our nation, for government at the top can be no better—no more wise and prudent, no more forceful and effective—than we cause it to be.

This is a great responsibility of citizenship.

We must be ready and willing to answer the summons to public service whenever it comes—whether it be in our town or at any other level of government, and in whatever capacity, and we must serve not half-heartedly but enthusiastically and to the limit of our capability. For example, we must not shirk military service when our country calls. In the words of Washington: "Every citizen who enjoys the protection of a free government owes not only a portion of his property, but even of his personal services to the defense of it." We must stand straight and tall in the community for what we believe to be right, and speak out with a strong and penetrating voice against what we know to be wrong. It has been well said that "Silence is not always golden; it is sometimes plain yellow."

May each of us be able truthfully to say with the immortal Lincoln: "I do the very best I know how, the very best way I can, and I mean to keep on doing so until the end."—Elvis J. Stahr, Jr., Secretary of the Army.

A Dermatologic Tour of Some Clinics in the Orient

By

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(With seven illustrations)

I VISITED dermatologic clinics in the Orient, travelling by plane in the late summer of 1960. My interest was primarily in diseases of the skin and their ecologic and ethnologic influences. By prearrangement I had entree to clinics and hospitals in the cities visited starting at Honolulu. The principal cities visited were Tokyo, Hong Kong, Singapore, Bangkok, Benares, New Delhi, Bombay, Istanbul, Barcelona, Madrid to New York.

My hosts and informants were chiefs of the departments of dermatology in the clinics visited, and in addition, in Manila, Bangkok, Bombay and Istanbul, our former students who were trained at the Graduate School of Medicine, University of Pennsylvania.

The following summary serves to avoid repetition in subsequent discussion of each clinic visited.

Leprosy. In the countries visited, leprosy was conspicuous as a health problem. I observed patients with leprosy in a number of clinics including Spain. At the King Edward VII Memorial Hospital in Bombay, of 60,000 out-patients 6,000 were lepers. Desai[1] gives 2 million as the number of lepers in India.

Despite its antiquity and the good effect of modern treatment (DDS-Dapsonne) the disease, with its multitude of symptoms and its devastating effects if untreated, still remains of great public health importance in many countries. The world total is estimated at 10 million.[2] The known prevalence in the continental United States is less than 1000 cases.[2] Leprosy is a fascinating disease with still unsolved problems and is worthy of study by the best of minds.

Geographic Aspects of Cancer. Consistent with reports in the literature, there was low incidence of cancer of the skin of dark skinned races in clinics visited. For example, in Allison's study[3] skin cancer was 45 times as common among Caucasians as among non-Caucasians in Honolulu. In all of Japan there were 242 cases of malignant melanoma from 1890 to 1954. It is well known that cancer of the skin occurs less often in Negroes than in the white race.

The so-called Canton tumor (cancer arising in the naso-pharynx) is the second most frequent cancer in Hong Kong.[4] It predominantly appears in male Chinese from Canton living in Hong Kong or other parts of southeast Asia, such as Bangkok and Singapore. Dr. A. L. Gwee, pathologist at the Singapore General Hospital, however, was of the opinion that its alleged racial incidence is exaggerated.

Apparently there is high incidence of cancer of the mouth and of the penis in India. The former is thought to be related to irritant action of the concoction comprising chewing betel-nut (one ingredient is lime). Frequency of cancer of the penis among the populace of Malaya was observed by Fasal.[5] He regarded topical use of an aphrodiasic as an etiologic factor. A slightly higher rate of cancer of the penis in Johannesburg Bantu males than expected for white persons in the United States was reported by Higginson and Oettle.[6]

I was informed of the frequency of primary cancer of the liver in Singapore and in Bangkok. Higginson, Oettle,[6] and others report its higher rate of incidence in certain global regions.

From observations of patients in clinics and of pedestrians, the impression was gained that keratoses and other evidence of the senile skin was of less incidence than in non-Caucasians.

Disturbances of Pigmentation. In this category there is a greater incidence of derma-

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toses among non-Caucasians than among Caucasians. It is a peculiar problem of the more pigmented skin and predominantly included vitiligo, hyperpigmentation, apigmentation, leukoderma (and still other dermatoses discussed under Tokyo).

These disorders represented almost ten percent of office practice of Dr. Desai[1] in Bombay. The latter pertinently writes "the major burden of our color problems will be that of restoring to normal variegated dyschromias and depigmentations which you do not see as such."

Leukoderma (in the countries visited) is of importance in relation to leprosy. Leukodermic-like lesions of tinea versicolor resembles early lesions of neural leprosy. Leukoderma, as residual lesions of leprosy, may be of psychic importance to the patient. This is exemplified by one seen in Manila; although the smear test was negative, he had considerable psychic fixation on a solitary lesion of leukoderma on the forearm that he regarded as stigmatizing him as a leper. He sought treatment for its removal.

Mongolian Blue Spot. This lesion is conspicuous among pigmentary anomalies. It was to be found (if looked for) among infants and children in every clinic visited except in Europe.

It is present, as a bluish dark lesion of variable size and shape, single or multiple in the sacral, lumbar and gluteal regions, indeed, scattered over the entire back. Its highest incidence is in the Mongoloid race. It is present in almost 100 percent of all Japanese infants and has high incidence in Chinese infants. It occurs in Eskimos, American Indians, Filipinos, Negroes, Malay races, Polynesians, Portuguese, Russians and darker Mediterranean white races, and Mongoloid-Caucasoid hybrids. It is not a sign of pure bred Mongolian.

The coloration is due to melanoblasts situated in the deeper layer of the corium. The same cell has been found in European babies, rarely in sufficient quantity to cause the appearance of a blue spot. The opinion has been expressed that these cells represent the vestige of a phylogenetically ancient pigmentary layer.

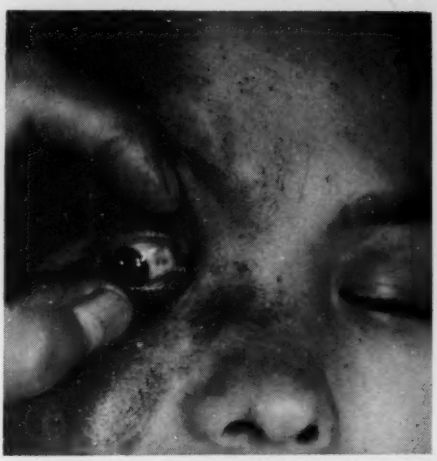

FIG. 1. Nevus of Ota (discussed in text) on face and conjunctiva. This is essentially a persistent Mongolian blue spot. There is some resemblance of this lesion to the port wine stain part of the Sturge-Weber Syndrome. Both lesions appear in the trigeminal region. (Courtesy of Dr. T. Kawamura, University of Tokyo).

The Mongolian blue spot occurring elsewhere, usually on the face, unilateral or bilateral, with or without conjunctival involvement is called nevus fuscocaeruleus ophthalmo-maxillaris (Ota—Fig. 1). In this event it does not disappear. Its incidence is stated to be 0.5 percent to 1 percent of the population of Japan.[7]

The Pigmented Skin and Contact Dermatitis. It is generally stated that the pigmented skin of non-Caucasians is more resistant to primary irritants and cutaneous allergens. The American Negro is no exception to this statement. The impression was gained that the incidence of contact dermatitis was less in the countries visited than that in the United States. Perhaps there is no, or fewer, exposures to the cutaneous irritants and allergens encountered in the United States, especially in industry.

There was no plant in the countries visited that caused such high incidence of allergic contact dermatitis as does the Rhus family in the United States. A possible exception is the Mango.

Honolulu. The population of Honolulu is 443,542; of the state of Hawaii 575,771. In 1950 the population by race was: Hawaiian or part Hawaiian, 85,391, Chinese, 32,225, Japanese 184,119, Filipino 60,453, Puerto Rican 8852, Korean 6492. The Hawaiian atmosphere that characterized Honolulu of former years is disappearing through new building construction and industrial expansion—a new oil refinery, cement plants, steel mill and a plant to make paper from bagasse, the residue of cane sugar.

Of the six major hospitals in Honolulu, Queens Hospital is the oldest. The most recent one is the hospital of Kaiser Foundation Health Plan. The latter is a closed panel group payment plan conducted by lay persons, that offers the subscriber unlimited medical service.

There is one leprosarium (Hale Mohalu) in Honolulu. The one (Kalaupapa) on the island of Molokai, well known through the missionary, Father Damian, is maintained only for the older patients who wish to remain. The incidence of leprosy in Hawaii is decreasing. The present known total number is 346. Interestingly, the Hawaiian Board of Health designates the disease "Hansen's disease" and the leprosarium as Hansen Hospital. (This is doubtless, as later discussed, part of the universal campaign to remove the stigma of the disease.)

There are eight well-trained dermatologists in Honolulu, all of whom practice dermatology exclusively. There are no exotic skin diseases in Hawaii. As reported by Arnold,[8] the dermatoses seen in Hawaii do not differ greatly from those seen in mainland United States. There is variation, however, in the incidence of some cutaneous diseases in comparison with the mainland. Psoriasis, light sensitivity dermatoses (polymorphous light eruptions, solar dermatitis), epidermophytosis of the feet, pemphigus and dermatitis herpetiformis are less common. There is an increase in incidence of alopecia areata and localized neurodermatitis among the Japanese and Filipinos.

Scabies is no longer seen in Hawaii. Of tinea of the scalp, Arnold has never observed M. anndouini infection and rarely sees tinea favosa. The two outstanding causes of allergic contact dermatitis is the mango tree (Mangifera indica) and only the blossom of the kahili flower (Grevillea Banksii). The mango is abundantly distributed throughout Hawaii; it has a comparable reputation as a dermatitis-producing plant as have the poison ivy and poison oak in the mainland United States. The latter plants do not exist in Hawaii. The sugar cane ear (boxer ear), an occupational dermatosis caused by sugar cane being carried on the shoulder and rubbing against the ear, no longer occurs through modern means of transportation. A traumatic dermatitis on the inner aspect of the ankle may occur among workers bundling sugar cane in which process the foot is used.

Tokyo. The airplane to Tokyo was pertinently marked "Wings of the New Japan." There is much evidence of Western influence in Tokyo, the largest city in the world; the population is over nine million comprising 828 square miles. Tokyo is a modern cosmopolitan city without evidence now of destruction by bombing in the last war. Pedestrians wearing kimonos or yukata are infrequently seen. New buildings, including modern office buildings, are among other evidences, of considerable industrial expansion.

Westernization is, however, less apparent in the deep rooted traditions that govern family life, professional and business life. One example is the suppressed role of women who customarily do not take part in the social life of men. Their role in dining in public restaurants is relegated to the Geisha.

There are more than 150 hospitals in Tokyo, (Fig. 2) the majority of which are old; modern equipment is difficult to obtain as is financial support of research.

There are about 300 dermatologists in Tokyo, about 80 percent of whom have hospital appointments. Full-time employed professors and assistants are paid (equivalent in our currency) $95 to $143 per month for the former and $36 to $60 for the latter.

Private practice is not permitted. This compares to the following salaries (equivalent to dollars per month): $43 is an average wage for city workers, $60 for middle rank civil officials, $56 to $70 for a typist, $31 for a maid (that lives in the household). The cost of living, however, is considerably less than in the United States.

The plan of medicine is socialized which, however, does not cover all persons. Eighty percent of the practice of medicine is through socialized medicine. The fees allowed under this system are relatively small so that few, if any, dermatologists can afford an automobile.

The specialty of dermatology includes diseases of the skin, cosmetic surgery, venereal diseases and urology; the latter includes minor and major urologic surgery. I saw excellent results of cosmetic surgery in the wards and clinics. Interestingly, one phase was excision of the medial epicanthus ("Mongolian fold") to widen the palpebral fissure, to eliminate the feature that characterizes the oriental eye. This operation on Japanese girls and women is becoming increasingly popular.

An outstanding health problem in Japan is tuberculosis, the morbidity rate of which is three million and yearly mortality is 150,000. Cutaneous tuberculosis is therefore more frequent than in the United States. One distinctive lesion that is fairly common is papulonecrotic tuberculide localized to the penis.

There are 15,000 leprosy patients in Japan, as contrasted with 30,000 in 1904.[9] Of the ten public and three private leprosaria in Japan, the Nagashima Aiseien Leprosarium is one of the largest with 1,600 patients. It has the distinction of being the headquarters of the dean of leprologists, Dr. K. Mitsuda, whose name is immortalized in his skin test for resistance to leprosy, the lepromin or Mitsuda reaction. Glucosulfone (Promin) appeared to be preferred to sulfoxone sodium (Diasone) in treatment of leprosy.

In addition to common diseases of the skin, distinctive dermatoses are pigmentary anomalies. Ito[7] pertinently writes: ". . . among the Yellow races there are types of pigmentary affections different from those found among the White and colored races. . . ." Of these affections that are rarely, or not, seen in the United States, only a few need be mentioned—keratodermia tylodes palmaris progressiva (Dohi and Mijake), dyschromatosis symetrica herdeditaria (Toyama), acropigmentatio reticularis (Kitamura); Melanosis of Riehl is of greater frequency than in the United States.

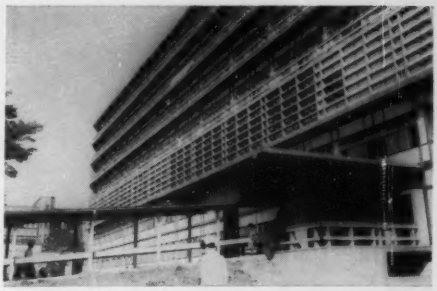

FIG. 2. A new wing of the Hospital of the Medical School of the University of Tokyo.

Manila. The population of Metropolitan Manila is about two and one-half million; that of the entire Philippines is about 23 million. Manila is a modern city with many new buildings and without evidence now of destruction by bombing in the Second World War. Industry outside of Manila is expanding. The climate in most months of the year is hot and humid. The native language is Tagalog. English is widely spoken.

Manila has three general hospitals, one of which is the Philippine General Hospital, part of the University of the Philippines. There are, in addition, seven private Universities, four of which have medical schools.

Of about 20 dermatologists in Manila, six are well trained whose practice is confined to dermatology. There is no trained dermatologist outside of Manila. Graduate training in dermatology has not been developed since very few graduates of medical schools are interested in such training. Some specialties have a board that issues a certificate of training. There is no socialized plan of medicine.

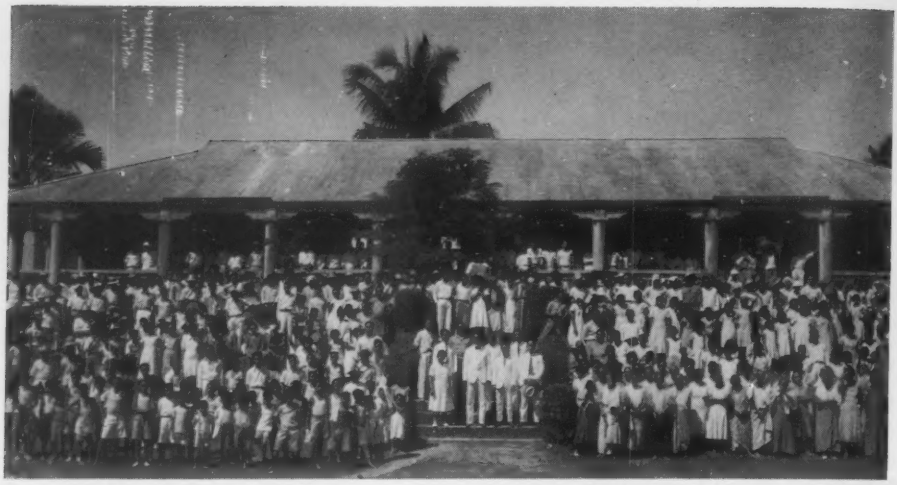

FIG. 3. Patients and Staff at Leprosarium built by the Leonard Wood Memorial at Cebu as a model institution. (Courtesy Leonard Wood Memorial For The Eradication of Leprosy.)

Outstanding health problems of the Philippines are tuberculosis and leprosy. New cases of syphilis are uncommon. There are very few tropical systemic infections. Yaws is now under control, it is endemic only in some sea coast towns.

All of the common diseases of the skin were observed in the clinic. Of fungous infection, tinea imbricata and chromoblastomycosis are seen, and of the scalp M. audouini infection is rare. Tuberculosis of the skin is frequently seen. Allergic contact dermatitis occurs from the plant Frangipani (known as "calachuchi"), narra, a hard wood, the bark of the Mangrove tree (used in tanning), and juice of the stem of papaya.

The study and treatment of leprosy is well organized under auspices of the Leprosy Research and Training Center in Manila. The director is Dr. Jose V. Rodriguez, a leprologist of high repute. There are eight distributed leprosaria, ten mobile units and four stationary clinics.

The province of Cebu is the most important focus of leprosy in the Philippines[10] (Fig. 3). Its estimated population is 1,160,00. The number of registered lepers (as of January, 1957) was 2749, of whom 1114 were bacteriologically positive. The incidence rate for the province for both "open" and "closed" cases is 2.37 per 1000. This is more than twice the number for the population of the whole of the Philippines. The incidence of the disease in different municipalities of Cebu varied from 0 to 7.23 per 1000. The number of cases of "open" type of the disease in Cebu province gradually decreased in two periods, 1904 to 1924 and 1930 to 1955. The total reduction in these two periods was 54 percent. This decreasing trend antedated the use of DDS. It was attributed to better nutrition and health habits, education, improved method of segregation, campaign to remove the stigma of the disease and to encourage early voluntary presentation of all cases in order to overcome the delay between onset of the disease to the start of treatment.

There are about 12,000 registered lepers in all of the Philippines and probably an additional 5000 not registered.

All bacteriologically positive cases are segregated. Under certain circumstances, that includes regular treatment, some patients may live at home. The average dose of DDS is 100 mgm. daily in conjunction with an antianemic medicine. Bacteriologically positive cases to become negative usually re-

quire one year of treatment for early cases, three to four years for advanced cases. The patient is discharged as cured after two continuous years of being bacteriologically negative.

Hong Kong. Hong Kong, an island separated by Victoria Harbor from Kowloon on the mainland, comprises the British Crown Colony. Prior to the Communist conquest of the mainland in 1949, some 600,000 persons lived there. Now the population is estimated at almost three million (it is believed one-third are under 14 years of age), one of the world's most densely populated cities. Hong Kong has become one of the world's major sea ports and one of its most beautiful, competing with Istanbul, Rio de Janiero and San Francisco, but more distinctive.

Contributory to the increase in population are about one million refugees—crowded into government built flats (Fig. 4) and living on roofs, on barren slopes in kindling-and-paper shacks and working for (equivalent to our currency) $1 a day.

Real estate values have risen; new building construction is increasing with new industries and workshops. This is reflected by the crowded streets and shops, new office buildings, the over-filled tenement houses and the large number of patients in the clinics I attended.

FIG. 4. Shek Kip Mei Polyclinic (extreme right) in Kowloon. The row of buildings are some of many Government flats for the million refugees. Hong Kong and Victoria Heights are in the background.

Of the 12 hospitals maintained by the Government the Queen Mary is the largest with 600 beds. It is the teaching hospital for the University of Hong Kong Medical School. There are 19 other hospitals, a number of nursing and maternity homes, and government dispensaries. The one leprosarium has about 500 patients and, in addition, nine out-patient clinics.

The outstanding health problem is tuberculosis[4] (*2%* of the population has active tuberculosis). New born infants are vaccinated with BCG. Diphtheria is the second health problem. The remaining most common infectious diseases are typhoid fever, bacillary dysentery and measles. There are no tropical systemic infections, small pox, yaws, or rabies. There is considerable subnutrition rather than malnutrition secondary to unbalanced diet and shortage of protein. Malaria has been almost irradicated and new cases of syphilis have decreased from 447 cases in 1954 to 12 in 1958.

Dermatology is classified under Social Hygiene in which is also included leprosy and venereal diseases. Dr. G. M. Thompson, a British dermatologist in government employ, and Major Minett of the British Army, are the only well-trained dermatologists in the Colony. Most patients with diseases of the skin are either treated free in government clinics, or by general practitioners. The system of medicine is not socialized.

I saw about 100 patients in the Shek Mei Polyclinic (Fig. 4). Their ages ranged from five days to 85 years. The predominating eruption was all varieties of pyodermas and localized neurodermatitis. Some of the patients had been treated with herbs by a Chinese "Doctor"; others wore, on part of the eruption, a plaster bearing, I was told, a concoction made from toads. The high birth rate of the Chinese was emphasized by a patient with an infant strapped to her back, an older child on each arm, and trailed by still several other children.

Pyodermas were frequent in infants and

children; of the latter a number had "running noses." Reported studies[4] showed high percentage of staphylococci resistant strains to pencillin and an increasing percentage incidence to other antibiotics.

Cases of cutaneous tuberculosis included tuberculosis verrucosis cutis, occurring particularly in children, attributed to direct inoculation by sputum.

A distinctive contact dermatitis was "clog dermatitis" (also seen in India)—dermatitis of the anterior dorsa of the feet corresponding to contact with the straps of their sandals. This was attributed to mechanical causation and also an allergic reaction to nylon and to rubber (as demonstrated by patch tests).

Cases of pediculosis and scabies were not as common as one would expect considering the overcrowded tenement houses. The high incidence of localized neurodermatitis impressed me as a racial predisposition. Consistently, its high incidence has been reported among Chinese in New York City by Rein and Snider,[11] in North China by Keim,[12] and in Malaya by Fasal.[5]

Singapore. Singapore, an island at the southern tip of the Malay Peninsula, has a population of over 1,200,000 of which 80 percent are Chinese. The rest of the population are Europeans (about 15,000), Indians, Pakistans, Malays and Eurasians. The weather is hot and humid. About 70 percent of the Malay Peninsula with a population of five million is jungle, inhabited by Malay's aborigines of different tribes.

Singapore is a fascinating city with many contrasts—race courses, polo and cricket grounds, different races of people, luxuriant foliage, botanical garden, Chinese and Hindu temples.

What is equally interesting is Singapore as a medical center and the facilities for the study of exotic diseases. There are five major hospitals (more than 300 beds) and nine smaller ones (less than 300 beds). Included in the latter are: Skin and Venereal Disease, Infectious Diseases and, interestingly, an Opium Treatment Centre.

The Singapore General Hospital is one of the largest (1191 beds); it is associated with the Medical School of the University of Malay. Its staff comprises 166 physicians, including the teaching staff of the Medical School. Its training school for nurses has 700 students, one of the largest in the world. The Maternity Hospital, I was told, is also the largest in the world; the usual number of deliveries is about 100 daily. The Leprosy Settlement has 1023 beds.

The outstanding health problems of Singapore are tuberculosis (prevalent rate about 3%), premature births and diseases of early infancy, influenza, gastroenteritis, dysentery, and typhoid fever. Poliomyelitis, diphtheria, and whooping cough are endemic. Of tropical endemic diseases are dengue fever, tropical typhus, bacillary and amoebic dysentery, intestinal worm infestations, ascariasis, ankylostomiasis, enterobiasis and virus encephalitis (some cases caused by Japanese B encephalitis). Beri beri is becoming less frequent; small pox and malaria have been eradicated. New cases of syphilis have decreased from 4575 cases in 1949 to 1035 in 1958; the rate of positive serologic test for syphilis for expectant mothers has decreased to 0.7 percent.[13]

An outbreak of 402 cases of type I poliomyelitis occurred in 1958. Mass vaccination of over 200,000 children with oral Sabin vaccine was carried out.

Of about 35 dermatologists in Singapore, four are well trained. The remaining are internists and general practitioners with special interest in dermatology. My host and informant was Dr. Khoo Oon Teik of the Singapore General Hospital. Dr. Teik was an internist and an equally capable dermatologist (his practice required speaking four Chinese dialects). I saw patients with him at the Skin and Venereal Disease Hospital and in the ward at the General Hospital.

Of the dermatoses that were commonly observed in the clinic, mention was made of tuberculosis, acne, pyodermas, psoriasis, acute and chronic lupus erythematosus, and atopic dermatitis. Despite greater exposure to sunlight, porphyria and light sensitivity dermatoses are seldom seen. Apparently

there is increased incidence of Vitamin A deficiency, sensitization dermatitis to streptomycin (among the nursing staff), a pruritic papular eruption that resembled Hebra's prurigo, contact dermatitis of the hands attributed to absence of washing machines in the home and of certain workers, to absence of automation in industry.

Of patients I saw in the wards there was a greater ratio of dermatitis exfoliativa and of pemphigus foliacious than in the United States.

I was informed of two common occupational dermatoses of the hands; one from a primary irritant action of formic acid in processing latex, the other from exposure to fresh pineapple juice in the canning of pineapples. In absence of automation (in contrast to its use in Hawaii) the hands of workers are freely exposed to pineapple juice. Polunin[14] has shown that the proteolytic enzyme (bromelin) in the juice is the cause of superficial erosions on the fingers, doubtless through digestive action on the proteins in the skin.

Tinea imbricata is endemic in the Malay Peninsula and is common in each of the main types of Malaya aborigines. I was informed that preliminary results in its treatment by Griseofulvin is favorable.

India. India is a land of many languages (some forty or more), contrasts, religious beliefs, dresses and customs. It is a huge country of about 12 million square miles, inhabited by 360 plus, million people, increasing at the rate of about six million a year. About 82 percent of the population live in villages.

Since the first of the five year plans was initiated in 1951, India has expanded industrially, economically, in public health and welfare. Before the first year plan, the mortality was 19.7 per thousand; in 1958, it was 8.8. The average age expectancy rose from 27 years to 32.4 years. The infant mortality rate has been reduced to 114 from 146. The number of hospitals and clinics increased from 3825 in 1947 to over 10,000 in 1957, and the number of medical schools from 40 in 1947, to 75 in 1960.

FIG. 5. The Irwin Hospital in New Delhi. A Government hospital of 1000 beds.

The outstanding health problems in India are tuberculosis, leprosy and tropical infections like cholera and typhus; one could add malnutrition, especially to proteins. Malaria and leishmaniasis have considerably decreased. Yaws is endemic only in certain regions. Smallpox is common, since there is no compulsory vaccination.

There is no reliable figures of the incidence of venereal diseases, syphilis has decreased but apparently not to the extent comparable to that in Europe and in the United States. Venereal diseases account for almost one-sixth of the clinic case load.[1]

At the dermatologic clinic in the Irwin Hospital (1000 beds) in New Delhi, (Fig. 5) my host was Dr. M. R. Sethi, and at the clinic in the King Edward VII Memorial Hospital in Bombay (population 4½ million), the director, Dr. Sharat C. Desai, and our former student, Dr. Mohan Dhurandhar. Dr. Desai has a well-organized clinic and laboratory. On his staff, in addition to two well-trained dermatologists, are a biochemist and a mycologist. Additional principal dermatologic clinics are in Calcutta, Madras, Armitsar and Vellore.

There are about 100 dermatologists in all of India who practice dermatology exclusively. They are mainly in teaching centers. Other dermatologists are internists or general practitioners with a secondary interest in dermatology, and are included on the staff of most skin clinics. The majority of patients with diseases of the skin are treated

FIG. 6. The Dermatologic Clinic of the Hospital of the Medical School of the University of Istanbul. As is usual in Europe each specialty operates as an independent unit in a separate building.

in general hospitals, dispensaries, or by general practitioners.

Physicians in government hospitals are paid (equivalent in our currency) $30 monthly. This increases to about $100 in ten years. They are not employed full-time and engage in outside practice. Honorary consultants are not paid. Full-time employed physicians such as professors of medicine and surgery are paid $350 monthly. This compares to the following salaries (equivalent in dollars per month): Top government officials, $600; unskilled laborers, $15; clerks, $18; stenographers, $30 to $50; a house servant, $6 with meals included.

Post-graduate training in dermatology is essentially clinical. After one year a diploma is given. The new All India Institute of Medical Science in New Delhi, however, will now be the center of post-graduate training. New Delhi is also the headquarters of the Indian Research Council that fosters and coordinates medical research.

All of the common diseases of the skin are observed in the clinics and wards. There is, however, variation in incidence of some compared to Continental Europe and the United States. There is greater incidence of the following diseases: cutaneous tuberculosis, pyodermas, scabies, pemphigus foliacious, probably deep-seated mycosis-like mycetoma, nocardiosis, actinomycosis and, as already discussed, leprosy and pigmentary disturbances. There is less incidence of cancer of the skin, atopic dermatitis, dermatophytosis of the feet, acute and chronic lupus erythematosus, and light sensitivity dermatoses. Interestingly, the latter more likely occurs in Moslem women after discontinuing wearing their facial veil.

In Desai's report[1] of dermatologic problems in India he correlated certain cutaneous diseases with socioeconomic factors, not only in India but in other countries in certain epochs. More than one-half of the out-patient load of seven dermatologic clinics in India comprised diseases of poor economy and social diseases which included venereal diseases. In these two categories were: scabies, pediculosis, pyoderma, leprosy, skin tuberculosis, chancroid and fungous infections. Scabies and pyoderma accounted for 66 percent of cases in this group.

In contrast, of the skin diseases seen in his office practice (Bombay), there was reduction by one-half of the diseases of poor economy, reduction in percentage of social diseases, and increased proportions of allergy, eczema, lichen planus, psoriasis and bullous diseases.

Istanbul. Istanbul, a modern city of two and one-half million, is one of the oldest cities in the World. It was founded in the 9th century, B.C. The city overlooks the strategic Bosphorus, one of the seven natural wonders of the world.

Instanbul has four principal state and municipal hospitals. The hospital of the Medical School of the University of Istanbul has 1000 beds (Fig. 6).

There is one medical school in Istanbul, one each in Ankara and Izmir. Throughout Turkey there are government clinics for free treatment of syphilis, trachoma and malaria. Such clinics for leprosy are being inaugurated. There is no socialized plan of medicine. All physicians in government hospitals are paid but are permitted private practice.

There are from 130 to 150 dermatologists in all of Turkey; not all have hospital appointments. Some of this number have been trained in England, France or Germany. Training in dermatology in Istanbul comprises three years. A certificate is issued af-

ter writing a thesis and passing an examination given by the department of dermatology. No basic science lectures are given.

My host was Captain Kaya Ali Ozkeskin, dermatologist to the Army and Navy Hospital, who took me to skin clinics and wards. Part of his training was at the United States Naval Hospital in Philadelphia.

The major health problems in Turkey are, in the order stated, tuberculosis, leprosy and infant mortality, especially from enteritis. Typhus has become rare. The incidence of leishmaniasis (Fig. 7) has decreased and malaria has been almost eradicated. Favus is fairly frequent, especially in the eastern part of Turkey. The incidence of syphilis has decreased in the past ten years.

There are about 10,000 lepers in all of Turkey; the disease is increasing, especially in the eastern part. There are three leprosaria. More attention is given now to the disease than heretofore.

In addition to the common diseases of the skin I observed in the clinics and wards, mention may be made of the following: three patients with early syphilis, one with chancre of the rectum (I was told that the latter is not uncommon), patients with favus and one with tinea barbae (chronic fungous infection of bearded area), cutaneous tuberculosis, a greater ratio of pyodermas, localized neurodermatitis and dermatitis exfoliativa. More epitheliomas were seen in contrast to its low incidence in prior clinics visited.

FIG. 7. Leishmaniasis. A boil like lesion resembling syphilis, tuberculosis and other ulcerative diseases. It is endemic chiefly in tropical and subtropical countries, caused by Leishmania tropica. (Courtesy of Dr. Kaya Ali Ozkeskin from Istanbul.)

SUMMARY AND CONCLUSIONS

Tuberculosis and leprosy were outstanding health problems in most of the countries visited. Leprosy has been termed a disease of poverty. Its lower incidence is attributed not only to early diagnosis, treatment and segregation, improved nutrition and health of the populace are important factors.

Much has been written to show how ecologic influences dominate the pattern of disease generally and of disease reflected in the skin in particular. This was apparent in the countries visited especially in India and Turkey.

Infant mortality and longevity rates are indices of the health of a nation. Of diseases of the skin indices of socioeconomic conditions are septic infections, parasitic infestations, vitamin deficiencies, malnutrition, tuberculosis and leprosy.

The ethnologic aspects of diseases of the skin concerned pigmentary disturbances inherent to dark skinned races. The Mongolian blue spot was conspicuous among pigmentary anomalies. The high threshold of cutaneous irritability of the pigmented skin is its resistance to contact dermatitis. The racial predisposition of Chinese to lichen simplex chronicus (localized neurodermatitis); the lower incidence of cancer of the skin among non-Caucasians.

In most of the countries visited there were relatively few dermatologists who had postgraduate training abroad and who practiced dermatology exclusively. These dermatologists were chiefly in teaching centers. Predominantly patients with diseases of the skin

were treated in Government hospitals or dispensaries, by general practitioners or internists whose secondary interest was dermatology.

Post-graduate training in dermatology was rather limited, essentially clinical, and did not compare with that received in post-graduate centers in Europe and in the United States. This emphasizes the importance of developing graduate training in certain countries. Until then foreign post-graduate training will continue to play an important role in international medical education.

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References

[1] Desai, S. C.: Ecologic Perspective of Dermatologic Problems in India, Arch. Dermat. and Syph. 82: 701-710 (Nov.) 1960.

[2] Doull, J. A.: Current Status of the Therapy of Leprosy, J.A.M.A. 173:363-373 (May) 1960.

[3] Allison, S. D. Skin Cancer. Some Ethnic Differences, A.M.A. Arch. Dermat. 76:737-739 (Dec.) 1957.

[4] Annual Departmental Report by the Director of Medical Health Services 1958-59, Government Press, Java Road, Hong Kong.

[5] Fasal, P.: Cutaneous Diseases in the Tropics: A Clinical Study Based on Observations in Malaya, Arch. Dermat. and Syph. 51:163-171 (March) 1945.

[6] Higginson, J. and Oettle, A. G.: Cancer Incidence in the Bantu and "Cape Colored" Races of South Africa: Report of a Cancer Survey in the Transvaal (1953-55). J. National Cancer Institute, 24: No. 3, March, 1960.

[7] Ito, M.: Studies on Melanin, The Thoku Jour. Exper. Med. 55:1-104, Supplement Feb. 9, 1952.

[8] Arnold, H. L. Jr.: Incidence of Dermatoses in Office Practice in Hawaii, Arch. Dermat. and Syph. 53:6-9 (Jan.) 1946.

[9] Rothman, S.: A Dermatologist Trip to Japan, A.M.A. Arch. 80:88-90 (July) 1959.

[10] Rodriguez, J. V.: Leprosy Control in the Province of Cebu, J. Philippine M.A. 33:444-50, 1957.

[11] Rein, C. R. and Snider, B. L.: Lichen Simplex Chronicus in Orientals. Arch. Dermat. and Syph. 66: 612-617 (Nov.) 1952.

[12] Keim, H. L.: Impressions in Dermatology in North China, Arch. Dermat. and Syph. 17: 619-624 (May) 1928.

[13] Singapore Annual Report for 1958, Ministry of Health, Singapore, Malay.

[14] Polunin, I.: Pineapple Dermatoses, Brit. J. Dermat. 63:441-445 (Dec.) 1951.

Progress in the Army's Tuberculosis Program

By

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FROM World War I to the year 1950, tuberculosis caused great manpower and monetary loss to the Army. During the period prior to the advent of specific chemotherapy for tuberculosis, the relapse rate was so high that it was not feasible to return patients to active military duty. Consequently, patients with tuberculosis were treated to maximum hospital benefit and permanently separated or retired from the service.

In 1949, the military service was authorized to place on the temporary disability retired list (TDRL) patients with tuberculosis with the hope of returning them to military duty within five years if relapse did not occur. Because of the lack of knowledge as to the long term results of the various chemotherapeutic regimens, this was appropriate. In evaluating the retirement program, however, it was found that many patients were physically fit to return to military duty within the five-year period,[1] but did not elect to do so, generally because they had established themselves in civilian jobs and communities.

A continuing evaluation is being made at Fitzsimons General Hospital of this temporary retired group and Table 1 shows the results of this study during the period 1950-1958. You will note that of the 3059 cases of all types of tuberculosis reviewed, 2431 (approximately 80%) were recommended for return to duty. An additional 550 have not reached their five-year limit and are still under periodic review. Only 78 were recommended for permanent retirement. Of the entire group, there were only 44 relapses. Those individuals permanently retired were usually found unfit for duty because of relapse of their disease, very extensive residuals, emphysema and bronchiectasis.

It should be pointed out, however, that the total retired from the Army because of tuberculosis during the period 1950-1958 exceeds the number reviewed as the latter does not include: (1) individuals who became beneficiaries of the Veterans Administration and were dropped from the Army retirement rolls, or (2) sufficient time has not elapsed to make a follow-up study possible. Of the known 32 deaths among the patients temporarily retired from the Army in this period only three were due to tuberculosis.

Since early 1950's, monumental advances have been made in the treatment of the disease. This has occurred as a result of the development of various chemotherapeutic regimens associated with resectional surgery, when indicated. As a result of these advances, we now find it possible to treat successfully and return to duty more than 90% of career motivated individuals who have developed tuberculosis.

When the program of returning military patients to duty was started, short term therapy was used. This consisted of Streptomycin (SM), either alone or in combination with Para-Aminosalicylic Acid (PAS) for periods of four to eight months, along with conventional bedrest. As additional drugs, including Isoniazid (INH), became available the patients were given more prolonged therapy (18 months to two years), combined with resectional surgery when appropriate. Rest programs were continued as in the pre-chemotherapeutic days.

In 1954, a study was instituted at Fitzsimons General Hospital to evaluate the effect of early ambulation in the treatment of tuberculosis. This was a randomized study in

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TABLE 1

REVIEW AT FITZSIMONS GENERAL HOSPITAL OF CASES OF TUBERCULOSIS TEMPORARILY RETIRED 1950–1958

Type of Disease	Total Reviewed	Duty Recommended	Perm Ret Recommended	Still on Temp Ret	Relapse*
Pulmonary Disease	2311	1798	52	461	40
Pleurisy with Effusion	504	472	4	28	1
Other	244	161	22	61	3
Total	3059**	2431	78	550	44

* Relapses are duplicated on one of the other columns.

** The total retired from the Army because of tuberculosis during the period 1950–1958 exceeds the number reviewed as the latter does not include (1) the individuals who became beneficiaries of the Veterans Administration and were dropped from the Army retirement rolls or (2) sufficient time has not elapsed to make a follow-up study possible.

which patients, regardless of extent of disease, were placed into two groups, bedrest and ambulatory, and given combined therapy with INH-PAS or SM-INH in most cases.

The bedrest group were treated by the conventional methods in vogue throughout the country. The ambulatory group were permitted to be up and about the wards freely. Both groups were encouraged to continue their education by enrolling in appropriate United States Armed Forces Institute (USAFI) courses.

An analysis of this study, published in 1957,[2] indicated that patients in the ambulatory group did quite as well as those in the bedrest group, insofar as sputum conversion, cavity closure and x-ray clearing were concerned. Both groups were given prolonged convalescent leave after approximately one year of hospitalization in order to complete drug therapy prior to return to duty. It was noted that the ambulatory group lived a more normal active life during the leave period than did the bedrest group.

Because of the excellent results demonstrated by this study, bedrest was abolished as a part of the tuberculosis treatment regimen at Fitzsimons General Hospital for career personnel, except for the symptomatic patient. The occasional patient in the latter category, usually febrile with extensive disease, was permitted to ambulate as symptoms subsided.

Along with this, physical reconditioning was instituted and all patients were initially encouraged and later required to enter this program. Consideration was given to the older individual whose recent military duties were of a more sedentary nature. The 48 year old Master Sergeant who had spent the last ten years at a desk was not encouraged to try to keep up with the 25 year old Infantry platoon sergeant.

Patients were directed to start United States Armed Forces Institute study courses to better fit themselves for return to military duty. Many patients completed high school or college credit courses while in the hospital.

At the same time, an active occupational therapy program was instituted and patients were encouraged to pursue or develop natural skills in this area.

By the time the patient reaches the noncontagious stage, usually in four to six months, he is assigned duties within the hospital commensurate with his military occupational specialty, when possible. Recently, arrangements were made for Air Force patients to be transported to nearby Lowry Air Force Base by bus to perform duties commensurate with their Air Force specialty code. These patients are then returned to Fitzsimons General Hospital at the termination of the duty day.[3] When they enter this phase of the program, they are often permitted to live at home.

This type of work while in hospital status is continued for approximately six months

TABLE 2

MILITARY DISCHARGES* TUBERCULOSIS SECTION FITZSIMONS GENERAL HOSPITAL

Year Dischgd	Total Military Dischgs	Treated to MHB (Max Hosp benefit)	Dischgd Directly to Duty	Transferred to other Hospitals	Inact on Adm, Deaths and Irreg and Admn Discharges	Per Cent of Total Military Dischgs to Duty
1952	649	383	32	211	55	5
1953	656	335	62	275	46	10
1954	585	233	93	320	32	16
1955	415	192	108	192	31	26
1956	537	208	156	294	35	29
1957	376	204	173	155	17	46
1958	410	208	190	166	36	46
1959	320	180	163	106	34	51
	3948	1943	977**	1719	286	25

* These figures do not include discharges of those military patients who were admitted to the tuberculosis section and later discharged with a non-tuberculous diagnosis.

** Part of MHB total.

and the patient is returned directly to duty without extended leave. Chemotherapy is usually continued for six months while on a duty status.

Table 2 is a tabulation of military patients returning to duty from Fitzsimons General Hospital from 1952 through 1959. It should be noted that 977 patients were discharged directly to duty. The large number transferred to other hospitals are, for the most part, non-career military personnel transferred to Veteran Administration facilities. The relapse rates in patients returning to duty is low, being 1.8% with most of the relapses occurring in the 1952 group. The latter received what we now consider inadequate chemotherapy. Excluding this group, 782 patients have been returned to duty with a relapse rate of 0.8%.

Table 3 tabulates 530 cases returned to duty from 1954 to 1957. Only five relapses have occurred in this group to June 1960. Two with pulmonary tuberculosis, two with G. U. tuberculosis and one with skeletal tuberculosis. This is a relapse rate of 0.94%.

To summarize the advances made in the therapy of tuberculosis, it is interesting to compare the "1945 admission" to Fitzsimons General Hospital with the "1960 admission." The 1945 admission was placed in isolation at bedrest where he remained for one to two years and was then permanently retired with a good chance of re-activating his disease at some later date.

The 1960 admission hears little of a bedrest program. He is started on drugs and at four to six months is performing duty during working hours and when married is at home with his family after duty hours. Six months later he is usually discharged from the hospital to a new duty station. He continues drugs for an additional six months and his chance for relapse of his disease is small.

Because of development of this program, career-motivated personnel elect to receive treatment on a duty status in our own service facilities. Personal problems related to long term isolated bedrest are greatly decreased. The stay in the hospital is shortened which

TABLE 3

MILITARY PATIENTS RETURNED TO DUTY
TUBERCULOSIS SECTION
FITZSIMONS GENERAL HOSPITAL
1954–1957

Total	Relapses	% Relapses
530	5 2 Pulmonary 2 G. U. 1 Skeletal	.94%

represents a considerable monetary saving to the government. Finally, with restoration to a duty status, the services have not lost the experience and training of this highly motivated individual.

With our worldwide military commitments, exposure to tuberculosis is inevitable. Most young men are entering the services with negative tuberculin skin tests.[4] Some will convert to a positive test and of this group some will develop clinical disease. Most of these individuals can be treated successfully and restored to military duty. Progress in the Army tuberculosis program has made this possible.

REFERENCES

[1] Wier, J. A. and Tempel, C. W.: Resumption of Military Duty after Treatment of Tuberculosis. U. S. Armed Forces Medical Journal, 8:1814, 1957.

[2] Wier. J. A.; Taylor, R. L.; Fraser, R. S.: The Ambulatory Treatment of Patients Hospitalized with Pulmonary Tuberculosis. Ann. Int. Med., 47:762, 1957.

[3] Wier, J. A.; Schless, J. M.; O'Connor, L. E.; and Weiser, O. L.: Results on 105 Tuberculosis Patients Treated with More Adequate Combined Chemotherapy and Active Physical Rehabilitation. Trans. 19th V.A.—Armed Forces Conf. on Chemotherapy of TB, Cincinnati, Ohio, Feb. 1960.

[4] Palmer, C. E.; Jablon, S.; and Edwards. P. Q.: Tuberculosis Morbidity of Young Men in Relation to Tuberculin Sensitivity and Body Build. Am. Rev. TB, 76:517, 1957.

"China, the ever-growing threat, is increasing daily the mouths it has to feed, the bodies it must house, and the people for whom living room must soon be created. The rate of increase is a staggering 12 million lives a year. With a rising technology of modern medicine, public health and agronomy, the previous safety valves for population overgrowth—pestilence and famine—will no longer apply their traditional brakes on growth. As a result, the annual increment of people is increasing decade by decade, so that in 1980 China's present 600 million population will have swollen to more than a billion—a fantastic, nightmare figure considered in all its implications."—ALAN F. GUTTMACHER, *Babies by Choice or by Chance* (Doubleday).

A Cation-Exchange Resin Artificial Kidney: Development and Metabolic Studies

By

DAVID CHARLES SCHECHTER, M.D. AND HENRY SWAN, M.D., D.Sc., F.A.C.S.

INTRODUCTION

ACUTE renal failure may be precipitated by any of several etiologic factors. In the military patient, these causes are relatively few, and generally are related to either inadvertent transfusion of incompatible blood or the outcome of some severe form of injury. The latter may follow a surgical operation or be the result of massive trauma incurred during combat. The consequent renal insufficiency is often temporary in nature, and efforts are directed at prolongation of life by sustaining the patient through a critical phase of profound physiologic disturbances until secretion of urine is again resumed.

During World War II, it was not infrequent for individuals who suffered burial under debris or crushing-type injuries to develop anuria. Autopsy of such casualties during the bombardment of London disclosed that the renal dysfunction was due to necrosis of the renal tubules—that is, of the epithelial part of the nephron, whereas the glomeruli were intact.[1] Similar histologic changes appear to occur in many other instances of acute anuria, such as those accompanying shock or incompatible blood transfusions. It has become appreciated that the primary pathologic lesion in such states is a tubular one, and that acute anuria due to tubular necrosis is a reversible process, unless there is concomitant extensive glomerular disruption.[2,3] That treatment should be aimed toward obtaining a survival interval of approximately two weeks after the onset of anuria was recognized particularly in the Mediterranean Theater of Operations in World War II and during the Korean conflict. Experiences in the care of casualties who developed post-traumatic renal insufficiency amply demonstrated that prolongation of life implied a greater incidence of diuresis and a higher over-all recovery record.[4,5] This goal was enhanced in Korea by the establishment of a renal insufficiency installation within helicopter range of the forward surgical hospitals.

The treatment of the patient with acute renal failure is mainly supportive. This involves, ideally, attempts at correction of the disturbed metabolic state by an expert team of physicians and nurses supplied with the proper equipment. Such optimal circumstances are rare in warfare, the Renal Insufficiency Center in Korea notwithstanding. An integral part of the treatment is the employment of extracorporeal dialysis by means of an artificial kidney. Even in the United States proper, institutions which possess artificial kidneys and personnel competent to operate them are limited to larger hospitals or medical centers, so that transportation of patients to these last-mentioned is almost mandatory. The situation which prevails in most combat zones is considerably more taxing. As expressed aptly by Teschan, "Some artificial kidneys may not inconceivably have to be dropped by parachute, may have to be flown 10,000 miles along with their supporting equipment, or be carried on men's backs over considerable distances. . . ."[6]

This paper will describe an artificial kidney based on the properties of ion-exchange resins. Preliminary investigations have revealed that the apparatus may be effective in prolonging survival during the early stages of acute renal shutdown, and that its compact structure and simple operation may make it well suited for use even in forward aid stations in combat areas.

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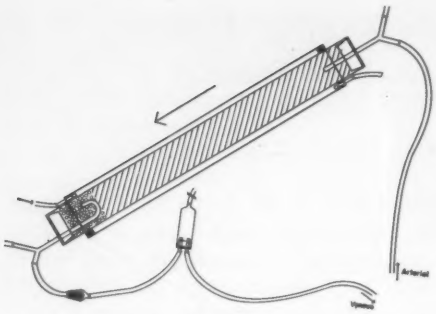


FIG. 1a. Apparatus of Muirhead and Reid. Subject's blood is circulated across an admixture of resins. Latter are regenerated periodically by flushing with a suitable solution via Y tubes. (J. Lab. & Clin. Med., 33:841, 1948)

DEVELOPMENT OF ION-EXCHANGE RESIN ARTIFICIAL KIDNEY

Historical. The first published account of an artificial kidney was in 1913 by Abel, Rowntree and Turner.[7] They employed collodion strips for dialysis, and ground the heads of leeches to obtain hirudin for anticoagulation. The procedure remained a laboratory curiosity until the momentous report in 1943 of Kolff and Berk, who demonstrated the feasibility of clinical hemodialysis by means of coiled cellophane tubing serving as a semi-permeable membrane of large surface area.[8] The patient's blood flows on one side of the membrane, and a suitable constituted rinsing fluid is placed on the opposite side to remove solutes which are transferred by virtue of a diffusion gradient. Numerous artificial kidneys patterned along the same principles have since been devised. The ones in most common use have the dimensions of a household washing machine, and necessitate the use of some 200 liters of prepared dialyzing solution. Hemodialysis is accomplished in from six to eight hours. It has been recently urged that this procedure be repeated daily for maximum prophylaxis in the treatment of acute renal failure.[9]

Following the suggestion of Elkinton and his associates,[10] cation-exchange resins have been employed either orally or by enema for the elimination of accumulated extracellular potassium in renal failure. The enteric route is associated with sundry disadvantages, including nonpalatability, unpredictability of duration of response, occasional impaction of the mass, and sometimes acidosis. There have been endeavors to overcome these undesirable features by circulating the subject's blood directly across beds of ion-exchange resin.

The first "resin artificial kidney" was designed in 1948 by Muirhead and Reid.[11] The apparatus, shown in Figure 1a, consisted basically of a glass column, 85 cm. long and 4 cm. internal diameter, and contained 500 ml. of an admixture of cation- and anion-exchange resins. Sterility was attained by rinsing with ethanol. The resin bed was primed with blood, plasma or albumin. Hemoperfusion was conducted for 10 min. intervals, then interrupted, and the resin regen-

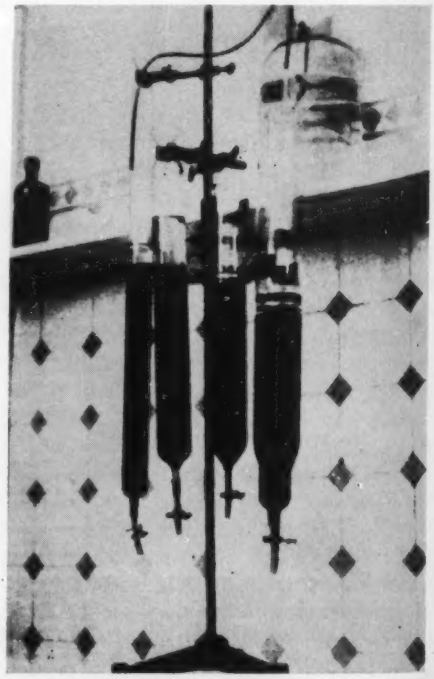


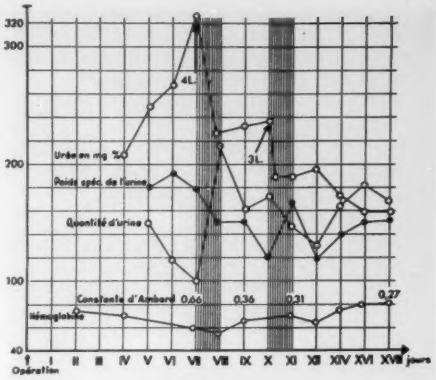
FIG. 1b. Apparatus of De Marchi and Bronniman. Blood is percolated through glass cylinders containing resin, then re-transfused. Wash solution is siphoned onto resin bed to regenerate it. (Helvet chir. acta, 18:133, 1951)

erated with a suitable wash solution. The authors reported using this apparatus on six bilaterally-nephrectomized dogs, but only gave data for one animal in whom, after four such perfusions, a total of 3.5 Gms. of urea were extracted, and life prolonged by 2.5 days. No mention was made of potassium levels. Deacidite®, the granular anion-exchange resin employed, was noted to be partly soluble.

DeMarchi and Bronniman, in 1951, reported the use of resins for removing nitrogenous waste products from blood.[12] Their device, shown in Figure 1b, consisted of a series of glass columns half-filled with a cation-exchange resin. A given volume of blood was drawn from the subject, passed through a column, then re-transfused. This was performed a number of times, a fresh column being employed consecutively, and the preceding spent column reconstituted by washing. The resin was sterilized at the outset by suspension in concentrated acid. Pyrogenicity was mentioned as one of the drawbacks encountered. Results in reduction of hyperazotemia in a patient and a dog are reproduced in Figures 2a and 2b, respectively. Again, no data were provided on potassium concentrations.

In 1953, Kessler, Liebler, Abrahams and Sass described an ion-exchange resin artificial kidney for lowering elevated potassium levels in the blood.[13] Their apparatus was similar to that of Muirhead and Reid.[11] It consisted of a 125 ml. separatory funnel attached to a 30 cm. glass column which contained 180 Gm. of a cation-exchange resin. Sterility was accomplishing by autoclaving. Hemoperfusion of eight uremic dogs was conducted for four to six hours in each case, and an average reduction of approximately 35 per cent obtained in extracellular potassium concentration after this flow period. The authors acknowledged the desirability of regenerating the resin, but stated that this would involve the frequent changing of columns, and make the procedure unwieldy.

The impractical characteristics of the aforementioned devices for clinical application are evident. Major problems are those



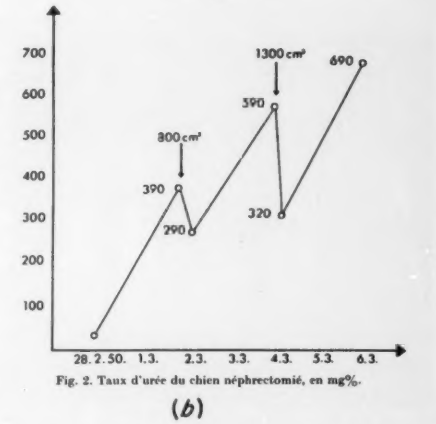


FIG. 2. Reduction in urea effected with device of De Marchi and Bronniman. Arrows indicate volume of resin-treated blood in a patient (a) and dog (b) with uremia. (Helvet chir. acta, 18:133, 1951)

referable to sterility, freedom from pyrogenicity, absence of hemolysis or other deleterious intravascular side-effects, a means for effecting rapid replacement of active resin, and fool-proofing from external contamination. The mechanism of ion-exchange as a temporary substitute for the impaired kidney has remained an attractive challenge, however, and in 1955 Kolff himself stated that, "The future for the resin artificial kidney is practically unlimited and almost unexplored."[14]

Authors' apparatus. Thirty cation-exchange resins were screened in vitro for selective efficiency in the sequestration of po-

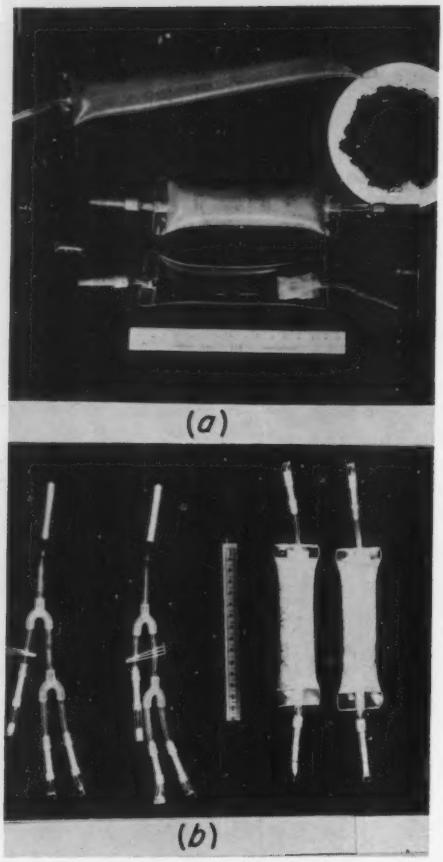


FIG. 3. Authors' apparatus. (a) Twenty-five and 50-Gm. columns shown. Right, amount of resin in 25-Gm. column. Below, longitudinal section through column. Inlet contains a stainless-steel ball-valve; outlet, a nylon filter of fine mesh size. (b) Sterile component parts included in sealed, waterproof envelope.

tassium from blood. Five of these proved to be satisfactory in their performance, and did not result in hemolysis upon contact of the blood with the resin particles. Further pilot investigations finally established a single resin, Dowex 50-X8, Na® (Dow Chemical Co., Midland, Mich.), as fulfilling all the requirements for safe hemoperfusion trial in the live subject. Dowex 50-X8, Na® is a synthetic sulfonated hydrocarbon polymer cation-exchange resin in the sodium cycle. It is composed of non-hemolytic, insoluble, brown-colored beads of 50 mesh size.

The resin artificial kidney was manufactured commercially (Fenwal Laboratories, Somerville, N. J.), according to the authors' specifications. It is constructed in its entirety of vinylite, a hemorepellent polyvinyl plastic, and may be sterilized readily by autoclaving without damage to either the plastic container or its encased resin. As depicted in Figure 3a, each column is 12 cm. long, 2.8 cm. in diameter, has a wall 0.2 cm. thick, and contains 50 Gm. of resin supported on nylon bolting cloth filters of 100 mesh pore size. A stainless-steel ball-valve is present at the proximal orifice to obviate entrainment of resin spherules at the donor end. When the column is to be used the steel ball is pushed into the resin mass to permit unhindered blood flow. Columns 25 cm. in length and containing 100 Gm. of resin are also available. Figure 3b shows the main components of the apparatus from the waterproof envelope in which they are packed. Other sealed, pocket-size packs contain a supply of sterile resin columns.

Figures 4a and 4b reveal two varieties of the assembled apparatus. There are two resin columns, in parallel, which can be attached or dismantled easily by means of connectors. The inflow (influent) limb consists of a sheathed 15-gauge laminar flow needle fastened to a Y-connector, one arm of which may be employed for sampling of the blood before percolation through the resin mass. The other arm leads to another Y-connector equipped with adapters to which the resin columns are joined. The outflow (effluent) system is similar to the inflow limb in one model. In the other model, a plastic container of known capacity which is inserted in tandem at the outflow end enables relatively accurate determination of blood flow through the apparatus, and also permits pressure transfusion of the resin-treated blood, if desired.

The needle of the inflow tube is introduced into an artery, and blood allowed to fill the entire apparatus. Less than 30 ml. of blood are required, so that priming with bank

blood is unnecessary. The effluent limb needle is then inserted into a vein, and hemoperfusion started. Fresh resin columns are substituted at selected time intervals. In order to maintain an uninterrupted stream of blood in the circuit, replacement of the columns is performed alternately as follows: Clamps are applied immediately proximal and distal to a column. The latter is disconnected and discarded. A fresh column is attached to the proximal adapter and allowed to fill with blood, following which it is connected to the distal adapter and the adjoining clamp removed to enable blood to circulate. Less than 10 ml. of blood are lost with each discarded column.

A pump is not employed. Because of the small dimensions of the apparatus and the minimal resistance opposed to flow, the subject's blood pressure is sufficient for unhindered circulation.

Metabolic Studies

Method. Twenty adult mongrel dogs were subjected to one-stage bilateral nephrectomy. After recovering from the operation, five were observed untreated, while the other 15 were treated with the resin artificial kidney.

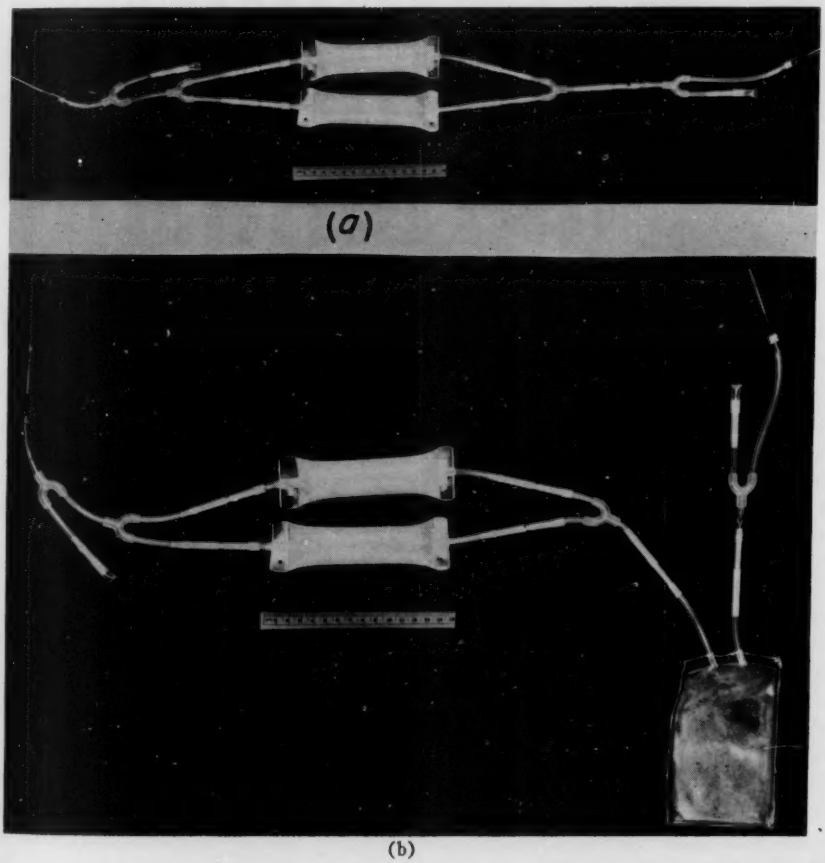


Fig. 4. Two models of ion-exchange resin artificial kidney. Influent limb at left. Laminar-flow needles are fused to tubing. In (b), plastic container of known volume is incorporated in effluent limb, and may be used for determination of blood flow, or for pressure transfusion.

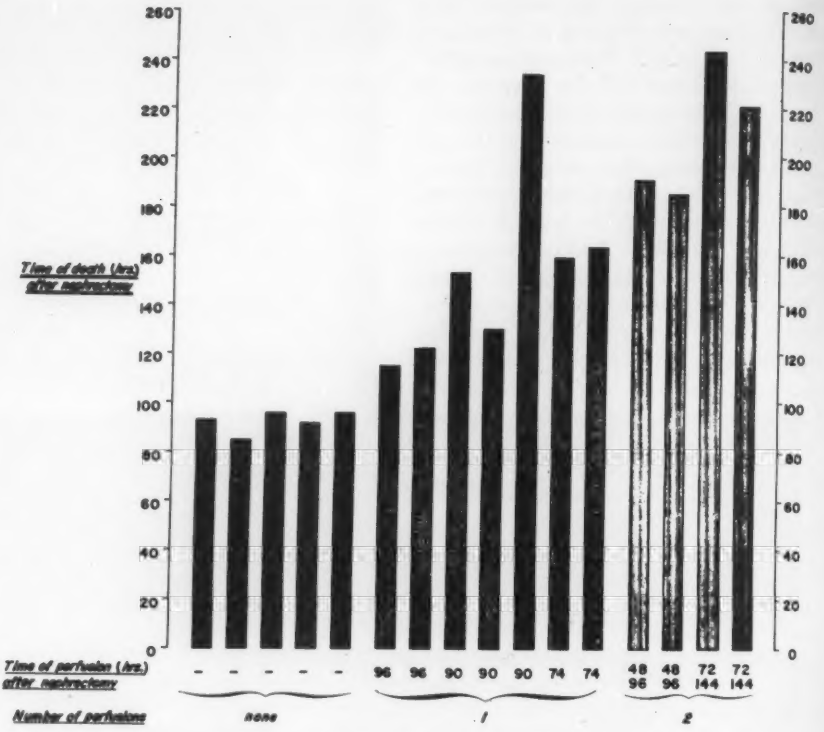


FIG. 5. Effect of hemoperfusion on survival time of bilaterally nephrectomized dogs. Repeated perfusion appears to result in net prolongation of survival.

In the latter group, anesthesia was induced and maintained with minimal doses of intravenous sodium pentothal. Two hundred units of sodium heparin per Kg. body weight were administered. The blood flow was from femoral artery to the contralateral femoral vein. Fresh resin columns were substituted every 15 mins. on an empiric basis. Hemoperfusion was conducted for at least 60 mins. Blood samples were withdrawn from the influent side-arm initially, at 15 min. intervals during perfusion, and 30 mins. following perfusion. After the last sample was obtained, the animal was given intravenously an amount of protamine sulfate equivalent to the heparin administered, and 20 ml. of 10 per cent calcium gluconate, as well as 500 mg. of oxytetracycline intramuscularly.

The treated animals were divided into a group subjected to only one hemoperfusion and another series subjected to two spaced hemoperfusions. Eleven of the treated group were perfused at 74 to 96 hrs. after nephrectomy. Two of the remaining animals were perfused at 48 and 96 hrs., and the last two at 72 and 144 hrs. post-nephrectomy.

Plasma sodium and potassium concentrations in the samples were determined by internal flame photometry. Blood urea nitrogen was measured by direct nesslerization.[15] Serum calcium was determined by a spectrophotometric technic using sodium chloranilate,[16] and magnesium levels by the titan yellow method.[17]

Results. Figure 5 shows the effect of hemoperfusion on survival time. The five control nephrectomized animals lived 96, 96, 93, 92, and 85 hrs. postoperatively, that is, 92.4 hrs. on the average. Seven of the animals in the group perfused once were observed until their demise. Death occurred within a range of 115 to 234 hrs. after

nephrectomy, the average being 153.7 hrs. The other four dogs in the group were sacrificed three hours after perfusion. There was no gross evidence of bleeding from, or injury to, any organs of the body. Of the animals perfused twice, those treated at 48 and 96 hrs. lived 191 and 185 hrs. postoperatively. The two animals treated at 72 and 144 hrs. lived for 243 and 221 hrs. following nephrectomy. The average survival period for these four dogs was 210 hrs. Thus, repetition of the procedure resulted in a net increase in the survival span.

Figure 6 shows urea nitrogen to have been affected only slightly, the blood norm never being attained. The pre-treatment mean level of 202.9 mg. per 100 ml. dropped to 175.8 mg. per 100 ml. at 60 mins., and rose to 177.2 mg. per 100 ml. 30 mins. after treatment.

Figures 7 and 8 reveal the influence of hemoperfusion on the arithmetic mean levels of blood cations. Prior to perfusion, the average potassium concentration was 8.0

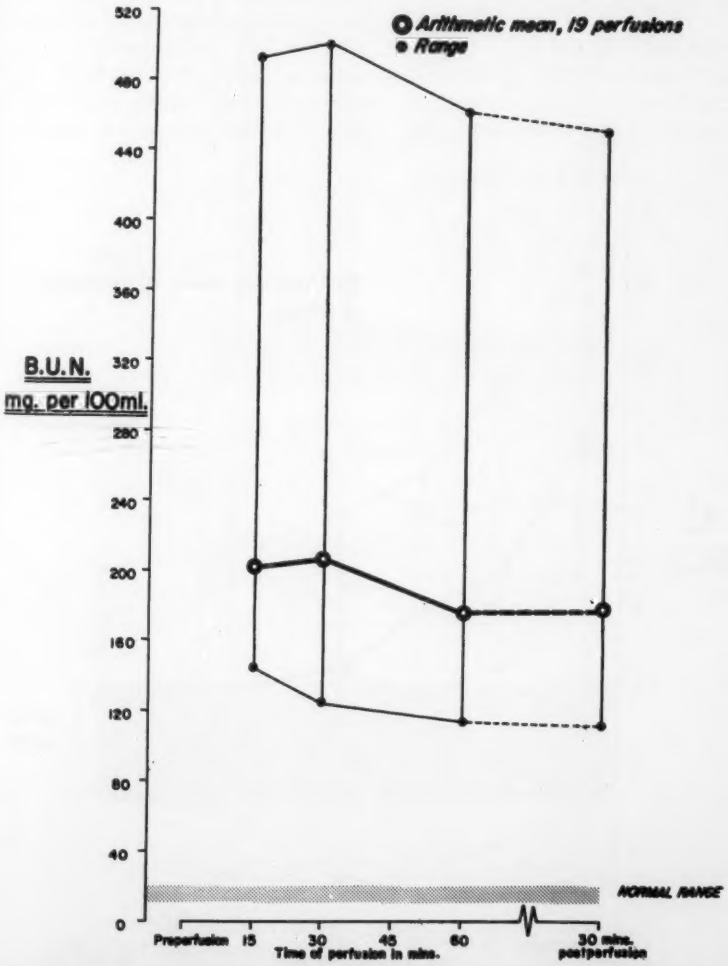


FIG. 6. Effect of perfusion on blood urea concentration in bilaterally nephrectomized dogs. There is a decrease, but this is slight, and the blood norm is not attained.

mEq./L. After perfusion for 60 mins., the potassium concentration was 5.0 mEq./L, and 30 mins. after cessation of perfusion it was 4.8 mEq./L. The mean sodium level rose slightly during perfusion, increasing from an initial value of 138.4 mEq./L to 145.5 mEq./L at the conclusion of perfusion. The latter increment resulted in a level still within the normal blood range, and represents ionic replacement since the resin employed is in the sodium cycle. The serum magnesium level declined from the original 3.1 mEq./L to 1.7 mEq./L at the end of perfusion, and 1.6 mEq./L after perfusion. The serum calcium concentration dropped sharply from 5.6 mEq./L to 2.6 mEq./L, but rose to a value of 3.1 mEq./L even before the administration of intravenous calcium gluconate after drawing of the last sample. It is interesting to note, moreover, that none of the treated animals developed tetanic manifestations or bleeding at any time during the procedure, despite the subnormal calcium concentration.

Comments

In the uremic syndrome, patients with prolonged renal insufficiency become critically ill because of the accumulation of metabolic substances ordinarily excreted by the normal kidney. The precise identities of all the retention products responsible for this complex syndrome are as yet undetermined. Certainly, urea is not a prime causal factor, although its concentration is employed as a clinical index of renal amelioration or decline. Hyperkalemia and hypermagnesemia are serious complications, and these individual electrolytes usually accumu-

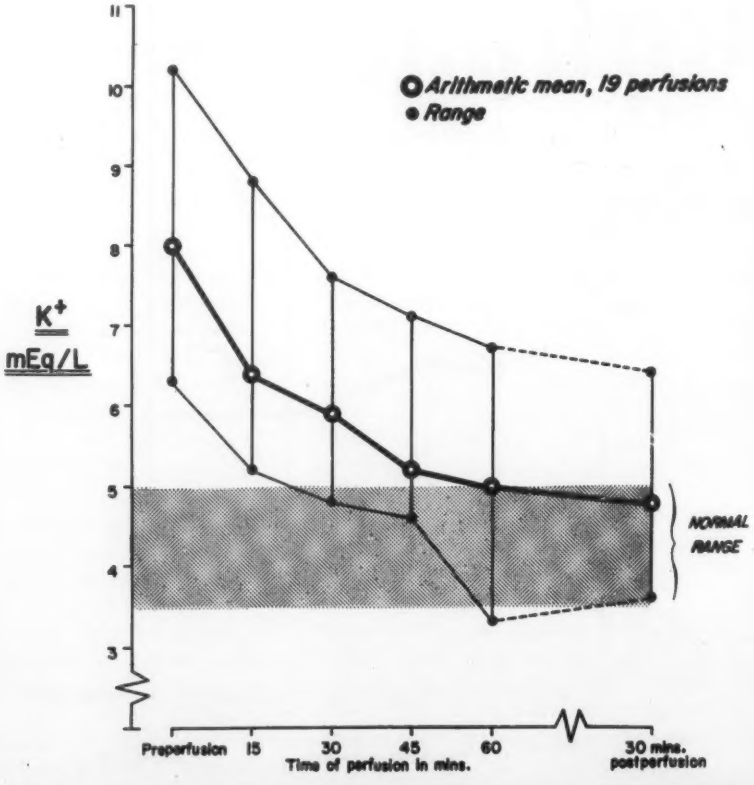


Fig. 7. Effect of perfusion on extracellular potassium level in bilaterally nephrectomized dogs, revealing a substantial decline.

late quite rapidly even in the early phases of renal shutdown. Potassium intoxication is particularly lethal since it is a not infrequent cause of death. Calcium concentrations decrease in the blood in renal failure, but replacement of this mineral ion is ordinarily achieved without undue difficulty by intravenous infusion.

The apparatus which has been described in this paper appears to fulfill effectively the immediate need for reducing hyperkalemia and hypermagnesemia in a comparatively

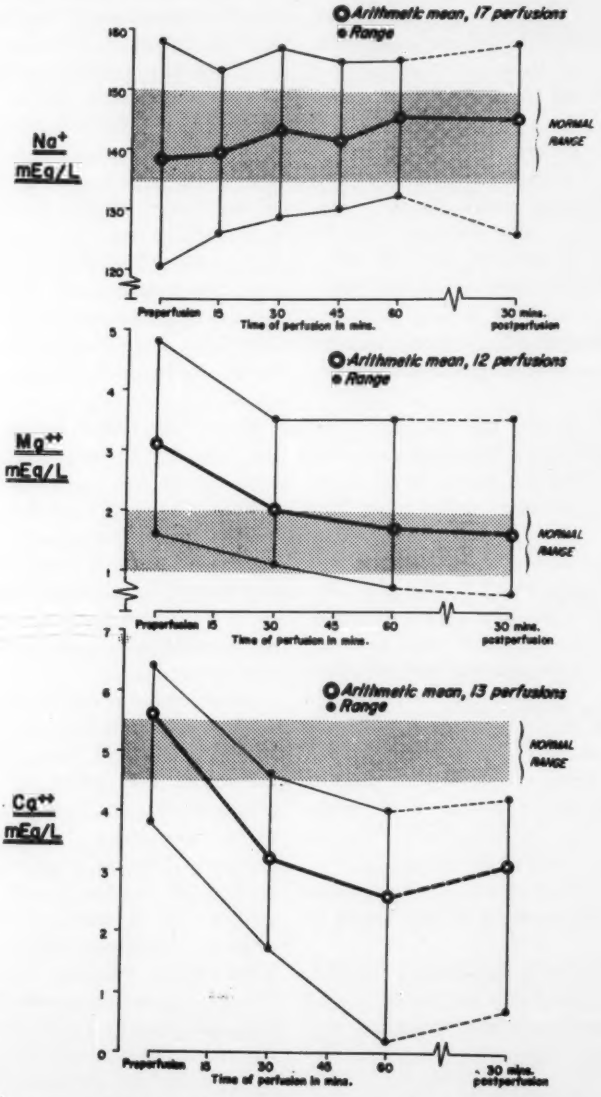


FIG. 8. Effect of perfusion on level of other blood cations in bilaterally nephrectomized dogs. The serum sodium concentration remains in the normal range. Magnesium undergoes a significant decrease. Calcium drops sharply, but the level shows a return even before infusion of calcium gluconate.

short period of time. There is possibility of similarly accomplishing a reduction of urea and other nitrogenous products by incorporation into the device of a suitably prepared resin. Since urea is not an electrolyte, a satisfactory resin would need to function by the physico-chemical process of ion-exclusion rather than ion-exchange, or by adsorptive attraction onto the particular resin moiety.

The problem of massive edema, coincident with anuria, is encountered almost solely in acute exacerbations of failure in patients with chronic renal insufficiency. Sodium-reciprocating resins obviously cannot be employed in such instances. For the occasional patient refractory to the usual methods of diuretic therapy, only the ultrafilter types of artificial kidney hold any promise of offering relief by the forceful mechanical removal of stagnant extracellular fluid.

It is worthy of note that autopsy of the animals sacrificed after hemoperfusion with the apparatus disclosed no evidence of internal bleeding although resins have been employed in vitro for extraction of blood platelets and leucocytes, in lieu of customary precipitation-elution technics. Winchell, Gollub, Ehrlich and Ulin, who used hemoperfusion across a large amount of resin to intentionally induce hypocalcemia and thrombocytopenia, also did not report hemorrhagic manifestations in their experimental animals.[18] The authors have not encountered any injurious hemic effects in four patients who have been placed to date on the apparatus, neither have any been observed in six other patients so treated elsewhere.[19]

The diverse advantages in a military situation of the resin artificial kidney would be manifold:

1. The apparatus is lightweight, inexpensive, compact, completely disposable, and all of its constituent parts lend themselves well to autoclaving.

2. A team of several specialized persons is not required to perform hemoperfusion.

3. Large volumes of rising fluids are unnecessary, and priming with blood or plasma dispensed with. This enhances control of relative constancy in blood volume, and ensures freedom from exogenously-elicited disturbances in hydrostatic pressure.

4. While a pump might expedite perfusion, neither it nor other noisy electrical appliances are needed if the patient is not in shock, and his blood pressure is adequate for "autotransfusion" across the small extracorporeal shunt.

5. There is complete visibility of all channels in the system during operation, and provision for rapid exclusion and short-circuiting of the device, if necessary.

6. Since large-bore needles are used, vessel cut-downs are not essential, so that the procedure is serviceable repeatedly without fear of thrombo-embolic sequelae.

7. The technic is adaptable, without hazard, to conditions such as peritonitis or other infections, when gastro-enteric or peritoneal lavage methods of dialysis are contraindicated.

8. Hemoperfusion can be carried out at the bedside. Thereby, initial and prompt care can be initiated, and transfer of the patient to a medical installation housing more elaborate equipment may be deferred without significant harm if satisfactory transportation cannot be mobilized readily. This would be an additional feature making the apparatus functional in smaller hospitals for use in contingencies.

Considerable research remains to be done prior to more efficient application of the apparatus in clinical states. There is need to investigate the effect of hemoperfusion across resins on formed elements of the blood, coagulation factors and osmolality gradients. Possibly, a more ion-selective resin may be developed, and use made of a combination of resins to effect more thorough and predictable elimination of accumulated cations, catabolic aromatic acids and nitrogenous retention products. The optimum time interval for replacing columns before the resin becomes "exhausted" is speculative at present, as are also the number of perfusions and spacing between the latter after the onset of auria to extend survival. Longer columns may be more appropriate for humans than the present arrangement;

but this would doubtlessly necessitate the interposition of a pump in the system to overcome such mechanical factors as resistance, turbulence, eddying and channeling of blood through the resultant greater resin mass. Such a modification, admittedly a warranted refinement, might serve to diminish the perfusion time and number of column changes, but would also, in effect, probably encumber an otherwise uncomplicated device.

Summary

1. A simple, inexpensive and compact extracorporeal device for use in the management of acute renal failure has been described.

2. The apparatus is completely disposable and easily sterilized. It consists, essentially, of columns of an insoluble and non-hemolytic cation-exchange resin across which hemoperfusion is performed.

3. Dogs rendered anuric by bilateral nephrectomy were treated with this apparatus. The survival time was prolonged significantly. There was substantial diminution in the concentrations of extracellular potassium, calcium and magnesium. The serum calcium level was restored in part by intravenous infusion of the gluconate salt. The blood urea nitrogen was decreased but slightly. The serum sodium level was augmented, but this increase did not extend beyond the limits of normal.

4. No tetanic or hemorrhagic manifestations were discerned during performance of the procedure.

5. The apparatus may prove valuable in military situations as an adjunct in the early care of patients with hyperkalemia and hypermagnesemia until they can be transported to specializing centers having more elaborate equipment and trained personnel.

References

[1] Bywaters, E. G. L.. and Beall, D.: Crush injuries with impairment of renal function. Brit. Med. J., 1:427-432, (Mar.) 1941.

[2] Strauss, M. B.: Acute renal insufficiency due to lower nephron nephrosis. New England J. Med., 239:693-700, (Nov.) 1958.

[3] Oliver, J., MacDowell, M., and Travy, A.: Pathogenesis of acute renal failure associated with traumatic and toxic injury. J. Clin. Invest., 30: 1307-1439, (Dec.) 1951.

[4] Board of Study of Severely Wounded, North African-Mediterranean Theater of Operations: Medical Department of Army in World War II: Surgery in World War II: Physiologic Effects of Wounds, United States Department of the Army, Office of the Surgeon General, 1952, p. 122.

[5] Teschan, P. E., and Baxter, C. R.: The future of hemodialysis in military medicine. J. Am. Med. Assoc., 166:11-4, (Jan.) 1958.

[6] Teschan, P. E., Panel Discussion on Artificial Kidneys. Trans. Am. Soc. for Artif. Int. Organs, II:127, (Apr.) 1956.

[7] Abel, J. J.. Rowntree, L. G., and Turner, B. B.: On removal of diffusible substances from circulating blood of living animals by dialysis. J. Pharmacol. & Exper. Therap., 5:275-316, (Jan.) 1913-1914.,

[8] Kolff, W. J., and Berk, H. T. J.: Artificial kidney, dialyzer with great area. Geneesk gids., Vol. 21, Aug. 27, 1943.

[9] Teschan, P. E., O'Brien, T. F., and Baxter, C. R.: Prophylactic daily hemodialysis in the treatment of acute renal failure. Clin. Res., 7:280 (May) 1959.

[10] Elkinton, J. R., Clark, J. K., Squires, R. D., Bluemle, L. W., Jr., and Crosley, A. P.: Treatment of potassuim retention in uremia with cation-exchange resin. Am. J. M. Sc., 220:547-552, (Nov.) 1950.

[11] Muirhead, E. E., and Reid, A. F.: Resin artificial kidney. J. Lab. & Clin. Med., 33:841-844, (Jul.) 1948.

[12] De Marchi, A., and Bronniman, R.: Construction of an artificial kidney based on the physicochemical properties of synthetic resins. Helvet. chir. acta, 18:133-145, (Apr.) 1951.

[13] Keesler, B. J., Liebler, J. B., Abrahams, J. I., and Sass, M.: Reduction of hyperkalemia by circulating blood through a cation exchange resin. Proc. Soc. Exper. Biol. and Med., 84:508-510, (Nov.) 1953.

[14] Kolff, W. J.: The artificial kidney—past, present, and future. Trans. Am. Soc. for Artif. Int. Organs, 1:1-7, (Jan.) 1956..

[15] Gentzkow, C. J.: Accurate method for determining of urea nitrogen by direct nesslerization. J. Biol. Chem., 145:531-544, (Apr.) 1942.

[16] Ferro, P. V., and Ham, A. B.: A simple spectrophotometric method for the determination of calcium. Am. J. Clin. Path., 28:208-217, (Aug.) 1957.

[17] Neill, D. W., and Neely, R. A.: The estimation of magnesium in serum using titan yellow. J. Clin. Path., Lond., 9:162-163, (May) 1956.

[18] Winchell, H. S., Gollub, S., Ehrlich, E., and Ulin, A. W.: Thrombocytopenia and hypocalcemia. Surgery, 45:357-365, ((Mar.) 1959.

[19] Pozza, N.: Personal communication, March 1960. Jefferson Medical Center, Philadelphia, Pa.

Post-Traumatic Stenosis of Common Bile Duct*

A Sequel of Blunt Trauma to Duodenum, Pancreas and Common Bile Duct

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AND

COLONEL EDWIN J. PULASKI, MC, *U. S. Army*†

(With four illustrations)

INTRODUCTION

WE ARE reporting the case of a young man who developed obstructive jaundice due to stenosis of the terminal portion of the common duct ten days following blunt abdominal injury. Exploratory laparotomy verified the stenosis which was associated with concurrent injury to the pancreas and second portion of the duodenum. Report of this case is justified by the difficulties experienced in arriving at a diagnosis, by the unwitting proper timing of operation, and by the fact that, to the best of our knowledge, no similar problem has been recorded in the literature.

REPORT OF CASE

A 23 year old Caucasian man sustained a steering wheel blow to the upper abdomen in an auto accident. He was admitted to the hospital shortly thereafter for possible internal abdominal injuries. While being positioned for scout films of the thorax and abdomen, he vomited a small amount of dark sanguineous material. Vital signs were stable. On examination there were no marks of trauma to the abdominal wall or thoracic cage. There was diffuse mid-epigastric tenderness and bowel sounds were hypoactive. Radiograms showed no free air in the peritoneal cavity and no other abnormalities. An abnormal serum amylase (154 units) was the only significant laboratory determination. Urinalysis was negative. A Levine tube was passed and yielded several hundred milliliters of bile, blood-tinged fluid and air. Vital signs remained stable, and, through the ensuing 24 hour period, the patient was comfortable except for persisting deep diffuse epigastric tenderness. Small cutaneous ecchymoses were now seen over this area; these disappeared in a week. When ileus was relieved after 48 hours of nasogastric intubation, the stools were formed and brown. Pain and tenderness abated, and oral feedings and ambulation were well tolerated.

One week following the accident the patient complained of nausea and began rejecting food. This was associated with renewed epigastric pain and vomiting after partaking of solid food and persisted for 3 days. Except for haziness in contour of the duodenal bulb and some delay in gastro-duodenal emptying of barium with a dilated antrum, upper gastro-intestinal x-ray studies (Figure 1) were interpreted as within normal limits. Intramural duodenal hematoma was considered as a possibility. On the tenth hospital day there was scleral icterus, the voided urine was dark, the stools acholic, and he rapidly developed generalized jaundice without headache, chills, fever or further abdominal pain. There was no past history of ingestion of or contact with hepatotoxins. There was no hepato-splenomegaly. The patient recalled recent contact with a friend under treatment for infectious jaundice, and infectious hepatitis was another possible diagnosis. However, blood chemistries including serum bilirubins, cholesterol, alkaline phosphatase, and transaminase gave values compatible with extrahepatic obstructive

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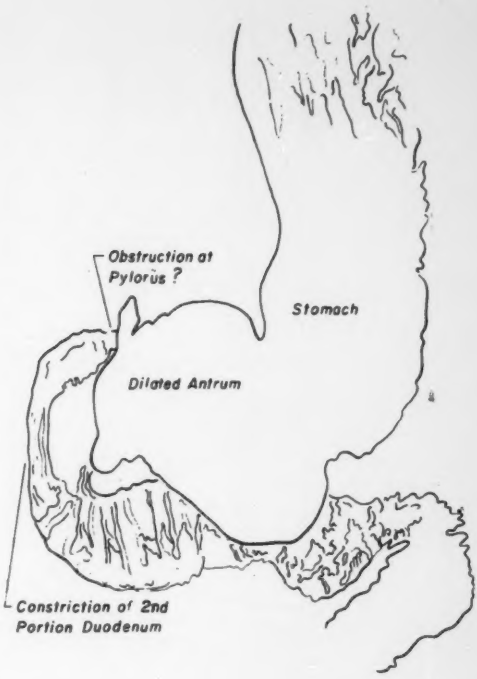


FIG. 1. Upper G.I. Series, June 12, 1959. (Line tracing from roentgenograph.)

FIG. 2. Upper G.I. Series July 10, 1959. (Line tracing from roentgenograph.)

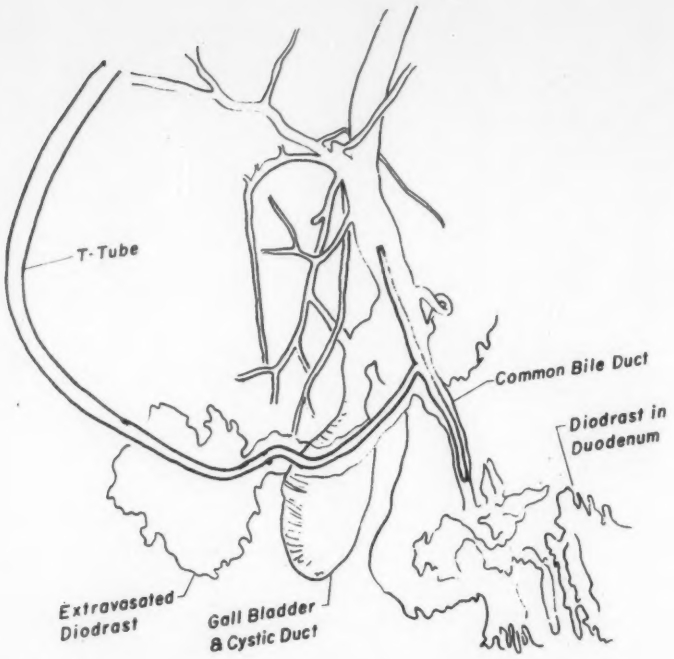


FIG. 3. T-Tube cholangiogram, July 22, 1959. (Line tracing from roentgenograph.)

jaundice. Intravenous cholangiograms to visualize the biliary tree were unsuccessful. Repeat upper gastrointestinal barium studies four weeks after the accident again were interpreted as revealing no abnormalities except deformity in the region of the duodenal bulb, interpreted as due to extrinsic pressure. Anorexia and icterus persisted, but no vomiting.

Repeat upper GI series (Figure 2) redemonstrated the duodenal deformity. In addition there was now noted a concentric constriction of the second portion of the duodenum with some disturbance of the mucosal pattern about the constriction. The duodenum at the point of constriction was estimated as 0.5 centimeter in diameter. When the radiologist compared this latest series with previous films, he concluded that this constriction was present though poorly demonstrated on the earlier films.

The jaundice appeared to reach a plateau and remained so over the next 4 weeks. Inconstant epigastric soreness and anorexia persisted and progressive loss of body weight was evident.

The consideration of the diagnoses of intramural hematoma of duodenum and then infectious hepatitis in part occasioned delay in surgical exploration. Operation was performed 57 days after the accident. Dense adhesions were encountered between the gall bladder, common duct and gastro-hepatic omentum, transverse colon and lateral parietal peritoneum. Following lysis of adhesions, the descending duodenum was mobilized; there was no evidence of hematoma or retroperitoneal injury. Further exploration revealed a normal appearing gall bladder and cystic duct and a scar-enmeshed, funnel-shaped stenosis of the retro-duodenal portion of the common bile duct with proximal dilatation. A deep sulcus, almost, but not completely through the substance of a scarred nodular pancreas was observed between the body and tail of the pancreas; this

was interpreted as a healed contusive and compression injury of the gland. In addition, there was a napkin ring, stenotic constriction of the second portion of duodenum with only negligible proximal dilatation.

The common duct was entered supraduodenally; its wall was estimated to be 4 millimeters thick. Incision of the duct resulted in escape of a copious amount of cloudy viscid bile from the lumen. After numerous attempts, it was possible to pass a size #10 dilator to, but not through, the sphincter of Oddi. With the dilator in place, a transduodenal sphincterotomy was performed. Clear fluid under tension compatible with pancreatic juice escaped in the duodenum. Attempts to pass a T-tube from above failed. A 4 millimeter (outside diameter) rubber T-tube was then threaded to the dilator and delivered to the supraduodenal choledochostomy incision, positioned and tested for patency. The choledochostomy and duodenostomy incisions were then repaired. The stenotic duodenal ring was not disturbed because the lumen appeared adequate. Drainage via penrose drains was established and the abdomen closed.

The immediate post-operative course was smooth. Drainage of bile via T-tube was immediate and continuous in a volume of 400-600 milliliters per day. Jaundice abated within a week, blood chemistries gradually showed normal values, appetite and normal bowel habits returned, and uneventful wound healing ensued.

Weight gain was progressive together with return of strength and participation in rehabilitative exercises. A post-operative T-tube cholangiogram (Figure 3) revealed a patent and adequate common bile duct and

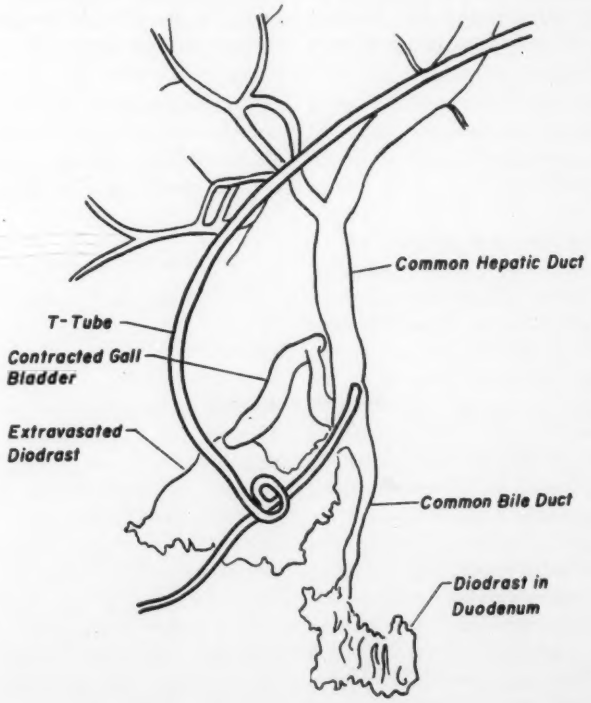


Fig. 4. T-Tube cholangiogram showing spontaneous extrusion of T-Tube, August 11, 1959. (Line tracing from roentgenograph.)

biliary tree. Thirty-seven days after operation (Figure 4) spontaneous extrusion of the T-tube occurred, the wound of exit healed and the patient completed his convalescence. He has remained well to date, 18 months after surgery.

Discussion

The insidious and initially inapparent sequelae of blunt injury to the pancreas and biliary tract are well known. Occasionally, reconstruction of series of events which led to the end pathology noted at either autopsy or laparotomy is moot or speculative. Therefore, it would be less than realistic to offer categorically an "explanation" for stenosis of the common bile duct and the presence of the constrictive band which was noted to encircle the descending duodenum.

Several possibilities exist: (1) direct contusion of the common bile duct resulting in edema, scarring and stenosis; (2) indirect trauma to supporting connective tissue with resultant extrinsic perifibrosis; (3) trauma to duodenum and pancreas with resultant cicatrization of the retro-duodenal portion of the duct. It is more than likely that the genesis of the abnormalities noted at the time of surgery was a combination of (1) and (2), i.e., intrinsic and extrinsic compromise of the lumen of the common duct.

With the appearance of regurgitation jaundice exploration became mandatory. Definitive treatment was predicated upon operative findings and appropriate techniques utilized to restore continuity of the biliary system with the intestinal tract.

It has been statistically demonstrated that surgery which can be undertaken electively is superior to that done on an emergency basis. Time and the ability to correct electrolyte, blood volume and protein deficiencies augur for a reasonably successful outcome. The conservative management initially employed in the care of this patient facilitated therapy and an uneventful convalescence.

Alpha-Chymotrypsin in Cataract Surgery (Enzymatic Zonulolysis)

By

MAJOR THOMAS J. TREDICI, USAF, MC

IN THE spring of 1957 Joaquin Barraquer, of Barcelona, Spain, injected a solution of alpha-chymotrypsin into the vitreous of an eye that had been injured several years before; he hoped that this might absorb the old blood in the vitreous. On observation of the eye the next day he noted that the lens was completely dislocated. This started him on the study of the use of the drug as an aid in cataract surgery. In 1958 Barraquer[1] presented his findings on the use of this substance to produce zonulolysis. His conclusions were that the enzyme did produce lysis of the zonule and thereby enhanced the extraction of the lens. In the early reports on the use of the drug it was felt that it would open a new field of lens surgery especially in the very young. More recent reports show that the drug is effective, but not especially in the young patient where it would have been of greatest benefit.

BIOCHEMISTRY AND ACTION

Alpha-chymotrypsin is a proteolytic enzyme. It has fibrinolytic as well as proteolytic actions. It is obtained from the veal pancreas as chymotrypsinogen. Five different types can be obtained but alpha-chymotrypsin has greater powers of diffusion and more stability than the other types. It was first isolated in crystalline form in 1933 and was named chymotrypsin to denote its clotting action on milk, thus distinguishing it from trypsin, which does not clot milk but does clot blood.

The exact effect of the enzyme on the zonule is yet unknown. Some believe a lysis of the zonule fibers occurs. Leg[2] feels that the effect is on the zonule fibers by a process of uniform fragmentation which followed stretching and thinning of the fibers in 3 to 5 minutes. Thorpe[3] feels that the zonule itself is not torn but that it separates at its points of attachment at the surface of the lens capsule. In any case intracapsular lens extraction is made easier by the use of the enzyme. At the beginning of this series only the original Spanish product (Quimotrase) was available direct from Barcelona so it was used in the first seven cases. Zolyse manufactured by Alcon Laboratories of Fort Worth, Texas, was used on the last 9 cases. In both cases the concentration was 1:5000.

MATERIAL AND TECHNIQUE

The enzyme was used in 16 of the last 18 cataracts extracted. It was not available in one of the cases and we did not have to use it in the second one, a dislocated traumatic cataract. The patients' ages ranged from 33 to 90. Most were in the 55 to 75 age group. Some of the patients were on active duty, others were dependents and most were retired.

The surgeon does not have to alter his technique in any way in using the drug. We used local anesthesia on all the cases. On nine of the cases a conjunctival flap was used and on 7 a corneal section was done. Two of the cases were a combined procedure (with iridencleisis) because of glaucoma. In 3 a round pupil was done, in the remainder an iridectomy was performed. The sutures may be pre or post placed. In our cases two to five sutures of 6-0 black silk were utilized. Following the iridectomy or iridotomy, 2 cc. of 1:5000 alpha-chymotrypsin was irrigated into the anterior chamber either under the iris through the iridectomy opening, or through the iridotomy. In preparation of the solution a dry sterile syringe and needle must be used to avoid contamination with other medications which may lessen the efficiency of the drug. A blunt tipped irrigating needle was used for irrigation. After 3 to 4 minutes the

anterior chamber is again irrigated with 2 cc. of normal saline solution or if Zolyse is being used the balanced salt solution. At the end of this time it is usually noted that the lens has come forward into the anterior chamber. Now, either the erisophake or capsule forceps can be used to deliver the lens, usually only gentle counter-pressure with the expressor is necessary. The sutures are tied, air may be injected into the anterior chamber and a monocular patch is applied.

Results

The drug was used in consecutive cases without selection. A number of the patients in the older age group would probably not need any help in extracting their cataract intracapsularly, but the drug was used here anyway to study the effect. Only two of the patients in this series were in the younger age group, age 33 and 44 years. It is in this group that I think the enzyme has its greatest usefulness. Intracapsular extractions at this age are difficult because of a "tough" zonule and anything that would help here would decrease the distressing complications of extracapsular extraction such as secondary cataract, capsular retraction, iridocapsular synechae, etc. An easy intracapsular, round pupil, extraction was the result in the younger of these two cases. The 44 year old case was the only extracapsular extraction in the entire series. Fifteen of the sixteen extractions were intracapsular. This last case was one of the very first in which the enzyme was used and we now feel that the two minute wait then used was not long enough. We now wait approximately four minutes before irrigating the anterior chamber with the saline or balanced salt solution. Eighteen per cent is the figure usually given for the percentage of extracapsular extractions resulting, in planned intracapsular surgery. The percentage in this series with the enzyme is 6%. There was one case of iris prolapse in a round pupil extraction. This was easily replaced. There was one delayed reformation of the anterior chamber. Hyphema was present in one case. There were no cases of vitreous loss of rupture of the incision. Two complications that have been noted in using the drug to be more frequent than prior to its use are striate keratitis and iris pigment scattering. We encountered striate keratitis in 9 of the 16 cases and pigment scattering in only two. The striate keratitis had cleared in all cases by the 5th or 6th post operative day and no permanent residual was present from this condition. In the two combined procedures done (with iridencleisis), a normal tension resulted, as well as removal of the cataract. We do not intend to report the post operative visual acuity of the cases at this time, except to state that it was 20/40 or better postoperatively in all cases except one. This case did not show any improvement because of a finding of glaucomatous disc changes.

Comment

There were no cases of congenital cataract in this series. It is in these cases that the drug would really be a blessing; however, Troutman[4] reports disastrous results in this age group. It is not because the zonule is not affected by the drug, but because of a very firm attachment between the lens capsule and the anterior surface of the vitreous. There was no increase in the number of "ordinary" complications noted with usage of the drug, except for the striate keratitis. Some authors have reported wound rupture to be more frequent with use of the enzyme. All the cases in this series showed normal healing. A. Fink[5] in a recent article gives experimental evidence showing that the enzyme exerts no effect on corneal wounds. What late effects may result? Several cases have now been observed for 14 months without noting any deleterious changes in these eyes. It has been shown that the drug is of no use in cases up to approximately age 20. It could, however, find a use in a military practice for metabolic, complicated, and pre-senile cataracts present in the 20 to 45 age group. This corresponds to the ages of active duty for military personnel, and to the ages when intracapsular extraction is difficult to perform. We do not recommend its use in (1) trau-

matic cases if vitreous is already present in the anterior chamber, (2) cases of endothelial dystrophy, (3) in patients below the age of 20, (4) in the very old (above 70) where the zonule already is quite weak.

Summary

This is a report of the use of alpha-chymotrypsin (enzymatic zonulolysis) in cataract surgery in a military hospital. A brief history of the discovery and use of the drug is given. Its bio-chemistry and action is discussed. The technique in using the drug is outlined. Results show that the drug does facilitate intracapsular extraction without an increase in the number of immediate post-operative complications. The use of the enzyme in a military practice is discussed. Contraindications for its use are given.

References

[1] Barraquer, J.: Enzymatic Zonulolysis Contribution to surgery of the lens, presented before the 65th Congress of the French Ophthalmological Society, Paris May, 1958.

[2] Leg, A. P., Holmberg, A., and Yamashita, T.: Histology of zonulolysis with alpha-chymotrypsin, presented at the annual meeting of the A.M.A. Section on Ophthalmology, 1959.

[3] Thorpe, H. E.: Enzymatic Zonulolysis: Am. J. Ophth. 49:531, 1960.

[4] Troutman, R. C.: Committee on the use of alpha-Chymotrypsin in ophthalmology, Editorial, Tr. Am. Acad. Ophthalmology 62:875-876, 1958.

[5] Fink, A. I., Bernstein, H. N., Binkhorst, D.: Effect of alpha-chymotrypsin on corneal wound healing. AMA Arch. of Ophth. 64:134, 1960.

"There is just one all-absorbing topic the average Asian cares about. All he cares about, or thinks about, or talks about, is food, enough food. The average Asian is always hungry," reports an American engineer after two years in one of the crowded Asiatic countries. His remark emphasizes a fact that ought to be a guidepost in our world-wide contest with Communism. The Asian is not hungry because the land will not feed him; he is hungry because he does not know how to use the land. We cannot solve his problem for long by sending him food. What he needs most is sympathetic, understanding instruction and practical help in methods he can adopt. His need is not tractor farming, but good seeds, simple tools, and better know-how.—Wheeler McMillen, *Farm Journal.*

Wound Incurred from Unexploded Shell— An Unusual Surgical Problem

By

ERIK LARSEN, M.D., F.A.C.S.

(With one illustration)

THIS paper deals with an unusual type of surgical problem which I encountered while assigned as a surgeon in a Mobile Army Surgical Hospital (MASH) during the Korean War. On October 3, 1951 our hospital was located in Yangu, North Korea near the rugged mountainous eastern coast and was giving surgical support to the Second Infantry Division (USA) which was then engaged in heavy ground fighting at "Heartbreak Ridge." Many wounded were treated by our surgical teams and one of these American soldiers presented this unusual problem as related in the Far East Surgeon's letter.[1]

UNEXPLODED SHELL REMOVED IN DRAMATIC OPERATION

"In an operation which could well serve as a climax of a war movie, a surgical team of the 8209th Mobile Army Surgical Hospital recently removed an unexploded armor-piercing shell from the shoulder of an American soldier while two second division ammunition experts stood by to lend technical assistance.

"The wounded man, Pvt. A. C. B., was struck in the back by the 20mm shell which penetrated the left shoulder and curved into the fleshy part of the outer arm. Doctors said he was in good shape following the hour-long operation and that no permanent injury was likely to result.

"The shell, which is designed to explode on contact, had apparently been well spent when it struck the soldier. 'Why it didn't explode inside him is one of those unanswerable miracles' one of the doctors said. Surgery was performed by Capt. Erik Larsen and 1st. Lt. Joseph A. Amanti. Anesthetist was Major Jesse F. Brown, commanding officer of the 8209 MASH.

"Called in from a division ordnance technical intelligence team to guard against explosion of the shell removal were 1st. Lt. Richard A. Lyne and M/Sgt. Reddick F. Simmons.

"A spokesman for the mobile hospital who has followed the organization through hundreds of surgical operations from South Korea to the shadow of the Manchurian border during the unit's thirteen months on the peninsula, called the episode 'Our most drama-packed moment'.

"Pvt. Baree, evacuated within hours after the operation was disappointed. Someone had destroyed the 3 inch long, 1 inch thick souvenir he wanted to save."

The public relations officer of the X Corps, Eighth U. S. Army in Korea released information to the press concerning this unusual case and newspaper articles throughout the world carried headlines such as "War, Movie Style, Surgeons Cut Live Shell from American, Doctor Does Explosive Operation, Live Shell Cut Out Of G.I., Fjirnede Hojsksplosiv Ucksploderet Granat Fra Soldats Skulder," etc.[2]

The report as related in the Surgeons Circular Letter is a fairly accurate account of this event, but ever since this occurred I have wondered about the serious possibilities of this type of injury, namely, (1) was there actual danger of explosion in this patient before removal of shell could be effected?, (2) was there danger of injury to the patient and surgical team during the removal of this shell?, and (3) have similar type injuries been previously reported and if so, had injury resulted to the patient or surgical team? I will attempt to answer these three questions in this paper.

CASE REPORT

In the late afternoon of October 3, 1951, many battle casualties were being treated by the surgeons of the 8209 MASH and among the recent arrivals via ambulance from the 23rd. Regiment Collecting Station was a young American soldier with a penetrating wound of the left posterior shoulder area. This patient had been treated for shock and pain at forward installations and soon after

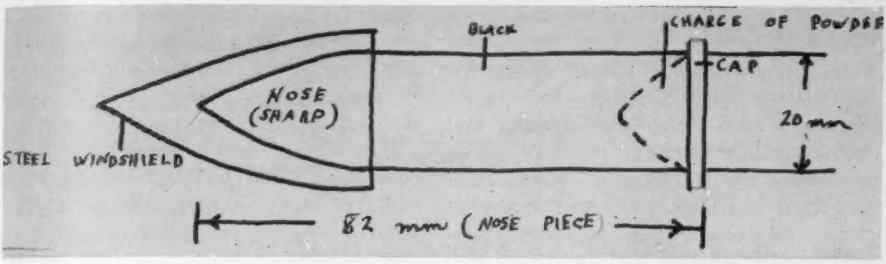


FIG. 1. Diagramatic sketch of 20 mm armor-piercing shell.

arrival a portable x-ray of the chest and left shoulder was obtained which revealed a huge missile imbedded deep in the posterior wall lying beneath the left scapula (which was fractured) and the rib cage with no evidence of penetration into the chest cavity.

Speculation immediately arose concerning the possibility that this might be an unexploded shell and one of the surgeons of World War II vintage recalled hearing about medical personnel during this period being injured on removal of unexploded missiles but he had no further information other than hearsay. Therefore, Army Ordnance experts were immediately requested for technical consultation regarding safe removal of the missile. Two Second Division Ordnance experts reviewed the x-rays and concluded that this was probably a 20mm Anti-tank or Armor-piercing shell and advised extreme care on its removal.

Our patient was immediately taken to the large tent operating room, given general anesthetic by the Commanding Officer (Major Jesse Brown) and surgery was performed by myself with 1st Lt. Joseph A. Amanti assisting. The two ordnance experts were available in the operating room and all other personnel were ordered to leave the immediate area. The wound in the left posterior chest wall medial to the scapula was enlarged and the missile was carefully exposed. Removal was effected by grasping the cap with a large forceps and gently removing it intact and immediately handing it to the ammunition experts close by. The wound was thoroughly debrided and irrigated with normal saline solution and packed with sterile fine mesh gauge which was standard operating procedure. The missile was found lying beneath the left scapula (which was fractured) and had not penetrated the chest cavity.

The procedure took one hour and I must confess, there was much anxiety on the part of the operating surgeons because we did not know what to expect and, of course, were much relieved to get rid of this foreign body. Our patient was evacuated the following day by ambulance and plane to Japan and made an uncomplicated full recovery.

TECHNICAL DETAILS OF SHELL

As accurately as can be determined from memory and opinion given by Army experts after removal of the shell and according to the report in Surgeon's Circular Letter,[1] the missile removed was a 20mm armor-piercing shell which obviously had not exploded. The shell approximately 3 inches in length and 1 inch in diameter had a windshield mounted over the nose to reduce air resistance, that being more sharply pointed than the shell itself.[3] This type of shell is usually fired from the cannon of low flying aircraft and in this case it was not determined whether fired by friend or foe. The precise action and purpose of some types of cannon shells are unknown, but speaking generally, four types are used:

1. High explosive (blunt nosed)
2. Incendiary
3. Armor-piercing (sharp nosed)
4. Trace shells

All of these consist of a nose piece sur-

rounding a charge of explosives with a metal cap fitting over the nose. Details vary with the type of shell. The base of a cannon shell is about one inch and its velocity in the neighborhood of 3000 ft. per second.[4] According to Roger Smith,[4] the removal of an unexploded 20mm shell is imperative; presumptively if a blunt nosed shell is present (highly explosive) it must be a dud, otherwise it would disintegrate on impact with the body. Only very hard impact will explode the sharp nosed armor-piercing type so the danger of this removal is lessened. The sharp and blunt nosed types can readily be differentiated by x-rays.

Literature Review

I have spent many hours during recent months at various medical libraries searching for references to articles on this particular subject and was unable to find any reference in American literature and only one in foreign literature which will be quoted in detail.[4]

Roger Smith describes a case in World War II in which a man was admitted to the hospital with injuries to his right leg, a result of cannon shell fire. The shell had passed through an open window into the room in which he was sheltered. Examination of the leg one-half hour later showed an entrance wound one inch wide, three and one-half inches above the patella on the anterior aspect of the right thigh with no exit wound. A large object was felt on the inner side of the knee, lying superficially, and was, at first, thought to be a piece of shrapnel or a fragment of the internal condyle of the femur. There was no fluid in the joint and a probable diagnosis of compound supracondylar fracture was made. A pre-op x-ray revealed the shell lying across the lower end of the femur, clear of the femoral vessels. It had entered the limb, base first. At operation the supra-patellar pouch was found to have been opened and the quadriceps torn across. The pointed end of the shell was seen and lifted out nose first. The wound was then treated in the usual manner and no ill effects resulted. This shell was not of the blunt nosed type; it had a smooth gray steel nose piece and aluminum cap 82 × 20 mm. The cap was indented in the center by the detonation at the breech of the cannon; the nose piece was intact.

The Texas Medical Association Reference Library was contacted and wrote that they had not been able to locate any material on War Injuries dealing with unexploded shells (Librarian Pauline Dieffield, 4-4-60). The reference to the English article on Cannon Shell Injuries was the only reference obtainable from the National Library of Medicine, Washington D.C. (thanks to Capt. Geo. J. M. Slowkowski, M.C., Division of Surgery, Walter Reed Army Medical Center, Washington D.C.). Other libraries contacted unsuccessfully were John Crear, Chicago, Ill., and the University of Illinois School of Medicine.

The case reported in this paper aroused some interest at the time but was quickly forgotten in the ensuing years until several years ago when I saw a television program on the "Navy Log" series called "The Human Bomb" which dealt with a similar type case as that of my Korean experience.

Navy Log Program Synopsis #7080
"Human Bomb"

A Japanese plane attacks a U. S. Destroyer in the Coral Sea and turns an American sailor into a living booby trap.

The sailor, Gordon, is seriously wounded by a 20mm shell during the attack. Later, the ship's doctor finds the projectile lodged within Gordon's body and it is apparent that only a slight disturbance to the victim may explode the shell.

I was anxious to find reference to a case similar to mine, therefore, I contacted officials of CBS Films Inc., with hopes that they might supply me with the source of their material, name of doctors, Navy references, or Medical Journal references since the program purported to be based on true-life stories with only change of names of the people involved.

Although the various officials of the television industry and CBS Films Inc., were

very cooperative they were unable to supply me with the information desired. My only conclusion is that the television story was fictitious and apparently based on hearsay as so many war stories are.

Summary and Conclusion

I have reported an unusual type of surgical problem which I encountered as a surgeon during the Korean War, namely, the removal of an unexploded 20mm armor-piercing cannon shell; and have made an attempt to find references to similar type injuries being able to locate only one in Lancet during World War II. A widely publicized national TV program dramatized a story called "Human Bomb" dealing with a similar incident during World War II but I was unable to substantiate the validity of this case.

I have attempted to answer three questions: (1) Was there danger of explosion in this patient before removal of shell could be effected? Theoretically yes, but practically speaking, no. (2) Was there danger of injury to the patient and surgical team during the removal of this shell? Again, theoretically there is danger during surgical removal to the patient and surgical team. Obviously, an explosion even as slight as a small firecracker would be hazardous depending on the anatomical location, anesthesia, etc. But evidently the chances of explosion with reasonably gentle handling of the shell is small. (3) Have similar type injuries been previously reported and if so, had injury resulted to the patient or surgical team? Only one recorded similar case was found in English literature and there apparently have been other cases but I have been unable to find evidence of any injury to patient or surgical team on record.

I would appreciate any information or reports to the contrary and must say that in our case the uncertainty of danger caused this to be a trying experience which was quickly forgotten on the successful conclusion of the operation.

1312 Bonita Dr.
Park Ridge, Ill.

References

[1] Surgeons Circular Letter, QHQ FEC, SCAP and Un Oct. 1951 Vol. VI No. 10.

[2] Pacific Edition Stars and Stripes, October 1951; Chicago Daily News, October 1951; Chicago Daily Tribune, October 1951; Aalborg Stiftstidende, Denmark.

[3] The World Book Encyclopedia, Vol. I page 364, 1960 Edition.

[4] Cannon Shell Injuries, Roger Smith M.B.L. Pool Resident Surgical Officer, Royal Sussex County Hospital. The Lancet Feb. 6, 1943 page 175-176.

[5] Navy Log Program Synopsis #7080 "Human Bomb" from CBS Film Information Services, 485 Madison Ave. N.Y. 22, N.Y.

The Need for Further Study in the Medical History of the American Revolutionary Army

By
HOWARD LEWIS APPLEGATE

V

SINCE the first battle of the American Revolution, writers and popularizers, patriots and historians have studied almost every aspect of that war. Some accounts have been worthless, others were best-sellers, but only a select few commanded the respect of the nation's scholars. There are excellent analyses of every feature of the Revolution except one, medicine and health. Despite the importance of the army's medical department, its history has never been fully appreciated by military historians, who are mainly concerned with campaigns, battles, and tactics. As Louis M. Duncan so aptly wrote, "Any reader knows how deficient are our histories in regard to medical affairs. To kill men is a picturesque affair, to cure them is not at all so."

Of the seven books that deal with medicine and health in the American Revolution in a very general fashion, four are legislative and administrative histories. The earliest to be published was Harvey E. Brown, *The Medical Department of the United States Army 1775-1873,* Washington, Surgeon General's Office, 1873. In part I which related to the Revolutionary period, the author exhibited a degree of interpretative skill, but unfortunately for the professional historian, Brown neglected to include either footnotes or a bibliography. Not until the 1920's did military medical history again receive any attention. Three works were published in this decade: William Owen, *The Medical Department of The United States Army, Legislative and Administrative History During the Revolution 1776-1786,* New York, Hoeber, 1920; James A. Tobey, *The Medical Department of the Army,* Baltimore, Johns Hopkins University Press, 1927; and Percy M. Ashburn, *A History of the Medical Department of the United States Army,* Boston, Houghton, Mifflin, 1929. Owen generally copied the journals of the national and provincial legislatures and offered no insight into the subject matter. Equally disillusioning was Tobey's work, as the chapters dealing with the Revolution were based almost exclusively on the older work of Brown. Ashburn was short and uninspiring, and in the chapter devoted to the years 1775-1818, the author merely paraphrased legislative journals and secondary sources. Of the four, Brown's work is the most reliable, even though it is over ninety years old.

The remaining three works approach the subject biographically. The first was Joseph Toner, *The Medical Men of the Revolution,* Philadelphia, Collins, 1876. His was the account of a naturally biased doctor trying to show that his colonial predecessors were patriots. The biographical approach was neglected until the 1930's. Louis M. Duncan, *Medical Men in the Revolution 1775-1783,* Carlisle, Medical Field School, was published in 1931; and James Gibson, *Doctor Bodo Otto and the Medical Background of the American Revolution,* Baltimore, Thomas, was published in 1937. The two latter works appear to suffer from the same defects. They lack organization and are too inclusive, as both serve as catch-alls for anything vaguely relevant to the subject. In both cases the authors have incorporated a great amount of primary documents into the text, but the works lack a bibliography and professional documentation. However, Colonel Duncan's efforts were not futile. He had prepared an explorative study of the early medical department. Yet, thirty years have passed and historians have not seized his subject with any great enthusiasm.

If contemporary scholars desire any in-

formation on the medical aspects of the Revolution, they must rely on Brown's work and Duncan's monograph, which despite their defects, remain the two best accounts. The first is ninety-four years old and the latter thirty years old this year. In the meantime, the availability of new documents has given historians fresh information which has led to a re-evaluation of the Revolutionary medical department.

It is true that the administration of the Continental Hospital Department had a direct effect on the efficiency of the American army during the years 1775-1783. Two constant members of American military units were sickness and inadequate hospital facilities. The American soldiers feared two enemies, the British and disease. It has been estimated by Duncan and Gibson that the soldier had 98 chances out of 100 of escaping death on the battlefield, yet in the hospitals, his chance of survival was reduced to 75 percent. Furthermore, the average rate of sickness in the American Army has been measured at 18 percent. At various times sickness severely crippled the American war machine and partially accounted for enforced periods of inactivity and even several defeats. Naturally, these defeats and weeks of stationary camping can also be attributed to poor weather, low morale, lack of sufficient numbers, and deficiencies in supplies and provisions. The constant losses suffered by the forces of Generals Horatio Gates and Nathanael Greene during the Southern campaigns were partially the result of a lack of medicines. In fact, every haggard soldier who returned to his home town was a silent force resulting in a rapid decline in enlistments.

The inadequacy of the Continental Hospital and the high rates of disease and death can be attributed to several factors. Originally intended to be temporary, the medical system was lamentably slow in gearing itself to the emerging needs of large scale warfare. The medical department was divided into several districts with semi-autonomous control, but this plan of decentralization proved inefficient as did schemes giving the Director General, the department's chief executive officer, complete authority. There was an unnecessary competition between regimental or locally controlled hospitals and general or centrally controlled hospitals. Furthermore, most structures used as medical installations were never meant to be hospitals and therefore, care of the sick sometimes became difficult. The medical department lacked the necessary requirements of supplies and medicines because of: their scarcity, poor transportation facilities, limited medical budgets, inefficient methods of purchase, waste, and corruption. Often, the medical service—in theory and on paper an elaborate system of hospitals, surgeons, and drugs—was not much more than the presence of a doctor until death came. The Continental physicians never developed a satisfactory system of collecting the wounded and many times battle casualties had to drag themselves to the nearest hospital. During most of the war years the medical department was not administered efficiently. This can be partially attributed to several factors: Congressional interference or disinterest, constant internal scandals and personality controversies, frequent public inquiries, and a lack of public confidence in the medical officers.

Some defects in the medical corps can be traced in part to the departmental personnel. A number of staff officers were appointed as a result of political influence rather than by professional accomplishment. Despite the comprehensive entrance examination, some incompetent doctors did evade the screening. The regimental surgeon's attitude toward his job was partially determined by the military conditions of life. The surgeons claimed that they were handicapped by: low pay; poor rations and shelter; lack of clothing, social standing, tenure, and protection from capture; inadequate pensions; infrequent promotions; and little or no recreational time. Ignorance of military procedure was another obstacle to the doctors' efficiency. It readily became apparent that the type of medical services that a regiment received depended upon the surgeon's

training, ability, and devotion to duty. Unfortunately, some had little training or ability and many lacked the patriotic sense of obligation or the sincere belief that it was their duty to ease pain and save lives.

Because of the high rates of disease and death, the doctors were held in low esteem by the soldiers. Many of the complaints against the physicians were perhaps no more than examples of the soldiers' constant habit of complaining about military life. Besides, there were a number of soldiers who had a deep suspicion of all medical officers. Aversion to doctors and fear of hospitals kept many men off the sick registers who might have recovered if given proper care. Some of these men chose to be their own doctors and administered homemade remedies often with tragic consequences.

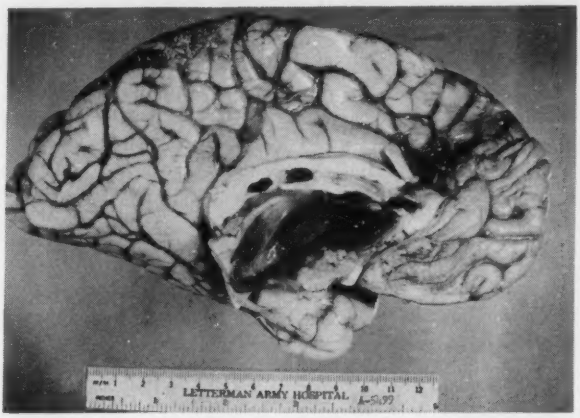
The failure of the Continental Hospital can also be blamed on the undeveloped state of medical science in America. Many doctors, especially the rural practitioners, employed old-fashioned methods. Lack of surgical skill greatly increased mortality from wounds. Remedial medicine, often based on superstition and tradition, offered no real relief for many of the hospitalized. Ignorance of the cause of diseases was a fundamental factor in epidemics and death. Although the department made some progress in preventive medicine, many of their recommendations were not put into practice in the regiments and companies. This can be explained by the presence of incompetent leadership on the lower levels and the accompanying absence of military discipline.

Generally speaking, this preceding information is what is currently known about the state of medicine and health in the American Revolution. In spite of the recent research into the American Revolution, there are still many aspects of military medicine left for further accurate exploration and analysis. For example, someone should continue investigations into the relationship between military sickness and recruiting. The personal life of the key hospital officers should be the study of some enterprising historian. Was the first Director, Benjamin Church a traitor? Was the second, John Morgan, an incompetent? Was the third, William Shippen, Jr., a corrupt gambler? A dietary study is necessary. More research is essential in the areas of camp sanitation and personal cleanliness. An analysis of the Congressional medical sub-committee would no doubt prove to be enlightening. The medical history of the American Revolution is a virgin field of untapped information and steps must be taken to encourage research and analysis in this area.

(Concluded)

Case for Diagnosis

TWENTY-THREE year old white female. Amenorrhea, 14 months. Anorexia, weight loss, loss of libido, and deterioration of personality accompanied by headaches and visual disturbances for several months. Clinical diagnosis: Anorexia nervosa. Comatose following craniotomy, with death 7 weeks after operation.



AFIP Neg. No. 59-10117

From the Armed Forces Institute of Pathology, Medical Illustration Service, Colonel Frank M. Townsend, USAF, MC, The Director. This case is AFIP Accession 991617, contributed by Letterman General Hospital, San Francisco, California.

Diagnosis is given on page 636.

EDITORIALS

Insignia

WE HAVE been asked by one member of the Association to give a résumé of the medal of the Association. The design is regularly shown on the cover.

When the Association was incorporated by an Act of Congress in 1903 its Constitution was revised. The description of the cross or medal as set down in Article V, Section 2 of that Constitution reads as follows: "The Cross shall be of gold, upon which shall be superimposed, a white shield, enclosing a shield of the United States in its proper colors, red, white and blue, with stars of gold—surrounded by the motto 'Omnia pro Patriae Caritate.'"

This Cross is suspended by a ribbon 1⅝ inches long and 1⅜ inches wide, folded on itself when attached to the Cross, and having a wide white stripe bordered on either side by a strip of red, the combined width of the red borders to be equal to the width of the white stripe.

The original badge, designed in 1892, carried a solid triangle attached to a bar, from which the Cross was suspended. The triangle was eliminated sometime before 1900, leaving the badge as it is today (Cross suspended from ribbon).

There are other insignia of the Association: the enamel bar, the rosette, and the button, all of which are designed to wear on civilian clothing.

Closed-Chest Heart Massage

A NEW and simple technique of emergency treatment of cardiac arrest is currently being taught and widely publicized.

The technique requires no surgery and no equipment and is applicable not only in cardiac arrest, but in drowning, choking, electric shock and other types of accidents.

The closed-chest heart massage technique was taught the Baltimore Fire Department's ambulance crews. Within three months, six people had been successfully revived. Among these was one of their own firemen whose heart stopped when he was overcome with smoke while fighting a fire. He is alive today and is teaching this same technique to his coworkers.

There are eight points which are stressed in the administration of this new technique:

1. *Check for pulse—in the throat rather than in the wrist—on either side of the windpipe near the collarbone.* If no pulse is detected, begin the chest massage at once.

   If there are two rescuers, mouth-to-mouth breathing should be given along with the massage until an oxygen tank can be obtained. Supplying the brain with sufficient oxygen immediately is the greatest need. The brain may suffer extensive damage if oxygen is lacking for more than a few minutes.
2. *Lay the patient face up on a solid support.*
3. *Tilt the head back until the chin is pointing at the ceiling.* Sagging of the head cuts off the air passage.
4. *Kneel so you can use your weight in applying pressure. Place the heel of your right hand on the breastbone, the fingers spread and raised so that pressure is only on the breastbone, not on the ribs.*
5. *Place your left hand on top of the right hand and press vertically downward, firmly enough to depress the breastbone one to one and a quarter inches (with a child, use only one hand and relatively light pressure).* The chest of an adult, resistant when he is conscious, will be surprisingly flexible when unconscious.
6. *Release the pressure immediately, lift-*

ing the hands slightly, then repeat in a cadence of 60 to 80 thrusts per minute, approximately the normal heart action.

7. *The patient should be taken to the hospital as soon as possible. Professional care will be needed even if the normal heartbeat and respiration have resumed.*
8. *Continue closed-chest massage until you get professional medical aid or to the emergency room of the hospital.*

From Pennsylvania Health Bulletin

In Memoriam

STUART E. WOMELDORPH, D.C.L.
1890-1961

Stuart E. Womeldorph, D.C.L., Executive Secretary, retired, has answered the call for eternal service with the Master Physician of us all.

The myriad of our members who in the central office or at our annual meetings have made the acquaintance of Mr. Womeldorph, called "Mr. Association" by many during his tenure, will join in a sense of sorrow at the news of his death.

Mr. Womeldorph, who was seventy-one years of age, passed away on July 12, 1961, at Arlington (Va.) Hospital, after a heart attack.

For the past year he had been under treatment for cancer of the larynx, and recently had a laryngectomy, which was followed by the heart attack.

Mr. Womeldorph, son of Henry Carlyle Womeldorph, was born in Opequon, Virginia, 27 June 1890. He attended public schools in Virginia and in 1909 passed the State Teachers Examination.

In 1909 he came to Washington where he was for two years a clerk in the Census Bureau. In 1912 he accepted an appointment in the field service for the Navy Department, and served at the Norfolk Navy Yard. In 1913 he returned to Washington and was employed in the offices of the Washington Terminal Company until he joined the staff of the Association of Military Surgeons, 7 January 1917.

The "staff" of the Association when Mr. Womeldorph joined it consisted only of the Editor, Colonel Munson; who soon had other duties assigned him and Colonel Hoff became acting Secretary-Editor. Mr. Womeldorph served with Editors Munson, Hoff, LaGarde, Church, Hume, Kean, Gilchrist, Phalen, and Bitner.

During World War I, Mr. Womeldorph declined a commission in the Sanitary Corps, in order that he might continue his work for the Association because its Secretary, as well as Surgeon General Gorgas, felt that his service in that capacity was of such importance that the risk of his being ordered away from Washington should not be taken. This was a real sacrifice on Mr. Womeldorph's part, since he thereby cut himself off from the various compensations, civil service preference, etc., which otherwise would have been his.

He made good use of his free time in Washington. In October 1917, he enrolled in the Washington College of Law and in 1920 graduated with the degree of Bachelor of Laws. He passed the District of Columbia Bar Examination in June, 1920, and was admitted to practice before the courts of the District of Columbia. After post graduate work he won the degrees of Master of Laws and Master of Patent Law in 1921. In 1924 he enrolled in the School of Political Science of American University and in 1926 received the degree of Master of Political Science, and Doctor of Civil Law in 1928.

Doctor Womeldorph, though he preferred to be called Mister, continued his connection with the Association of Military Surgeons, holding his five law degrees. In 1940, at the annual meeting in Cleveland, the Association took formal cognizance of Mr. Womeldorph's long, loyal, and efficient service, and made him Executive Secretary.

Mr. Womeldorph retired from the Association on 1 January 1958, after nearly forty-one years of devoted service. A man of fine personality, he filled his many years of service to the society with high intelligence, the utmost dependability, and an untiring industry.

He was a Mason, and belonged to Hiram Lodge No. 10, Washington Chapter No. 2 of the Royal Arch Masons and Washington Commandery No. 1, Knights Templar, and was a life member of Almas Temple. He was also a member of Sigma Nu Phi, a legal fraternity, and the District Bar Association. He attended Grace Lutheran Church.

He leaves behind his widow, Mrs. Freda L. Womeldorph, Apt. 308, 4400 Lee Highway, Arlington 7, Virginia. Her host of friends will make this blow a somewhat easier one to bear. He is also survived by one daughter, Mrs. Johanna Van Arsdale of Montclair, N.J., and two sons, Stuart E., Jr., of Newport News, Va., and John C. of Arlington, Va.

Funeral services were held at the Grace Lutheran Church on July 15, with entombment at Cedar Hill Cemetery, Washington, D.C.

Officers of the Association join the Editor and staff in extending most sincere sympathy to Mrs. Womeldorph and her family.

R.E.B.

The Association of Military Surgeons of the United States

Founded 1891, Incorporated by Act of Congress 1903

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Around the World

(Ser. IV, No. 8)

By

CLAUDIUS F. MAYER, M.D.

HIROSHIMA and Nagasaki remain eternal memorials to illustrate the hazards and perils of the Atomic Age to Mankind. A medical review in the United States has just published a special report on delayed action of radiation in the *survivors of the Hiroshima and Nagasaki bombings.* The findings of the Atomic Bomb Casualty Commission show that there was no fallout from either one of these explosions because the fire ball was too high to sweep up debris. The explosion left only 60,000 survivors in the two cities of whom 25,000 had been within 1500 meters of ground zero at time of the explosions. Those 7,000 who suffered major acute radiation sickness were within 2,000 meters. Beyond that radius, the radiation was little.

During the years 1948-1954, the *genetic damage* of these radioactive bombings has been thoroughly examined. This particular study included 70,000 pregnancies. In 10% of these, one or both parents were exposed to the bomb's effects. The children of these pregnancies were repeatedly examined, but among 27,000 children only 319 had major congenital abnormities, and there seemed to be no statistical correlation between such abnormalities and the exposure of the parents to radiation. The figures for stillbirth, birth weights and infant mortality were also unchanged. One type of lethal mutant showed up, and it tended to reduce the number of daughters of irradiated fathers, and the number of sons of irradiated mothers.

Other theoretically known radiation damages were also looked for; for example, the incidence of cataract, leukemia, and malignant tumors. Systematic study of 1,000 survivors disclosed no case of cataract. A wider survey found 9 *cases of cataract* among the survivors of the bombings who had been within 1,000 meters of ground zero. The search for *leukemia* disclosed 122 cases, most of them in people who were not less than 2,000 meters away from the center of explosion. *Tumors* of the lung, stomach, breast, ovary and uterus were also twice as frequent in the survivors as in the normal Japanese population. Many other possible effects of the bombing, such as deterioration of the visual perception, psychological effects, etc., have not yet been sorted out. The Hiroshima and Nagasaki experience also has been of great value because much has been learned from it about Man's future. The comprehensive analysis of such a huge mass of collected data is also a great achievement of medical statistics.

One important lesson of the Hiroshima and Nagasaki events is that the *protection of the civilian population* must be an essential part of any national defense. Yet, unaffected people in general may take the matter of "civil defense" lackadaisically. Thus, in West Germany, the Allensbach Institute for Research into Public Psychology studied the reaction of the domestic population toward civil defense. Only 40% of the people consider civilian defense a necessity. It is interesting that the majority of this 40% comes from small towns and villages, away from target areas, while the population in the industrial cities takes a more fatalistic attitude, and especially the women think that no effective defense is possible against atomic warfare.

Preparations for civilian defense are, nevertheless, going on in the European countries with more or less enthusiasm(?). The British Government, after reviewing its home defense plans, came to the conclusion that some additional expenditure is needed in order to make the program more realistic. A part of these additional sums will be spent on maintenance of medical services, includ-

ing stocks of equipment and materials, emergency hospitals, etc. In Germany, the Federal Civil Defense Board was set up at Bad-Godesberg in 1958; this board is in charge of administering the funds allocated for the purchase of stocks of medical supply. In Germany, the Ministry of Interior is responsible for the application of emergency measures within the general survival plan for the population. In Austria, likewise, the Ministry of Interior carries the civil defense appropriation in its budget. For the current year, about 11 million shillings were included for civilian defense in the budget.

Switzerland planned a series of *civil defense exercises* for 1961. Some of these have already been held, but the large-scale exercise at Soleuremand at Schaffhausen is to come in the fall. Preparations for civilian national defense have been also arranged in Belgium, which has a Civil Defense Corps and a special school where the employment of the various defense equipments is being taught. The Spanish civilian defense was also recently reorganized under the direct authority of the Presidency of the Spanish Government. Henceforth, it will be within the framework of the general national defense. By the way! The Fourth *International Civil Defense Conference* will be held from 7 to 17 October, this year, at the City of Montreux on the shores of the Lake of Geneva. It will be in connection with an international exhibition of all sorts of equipment for civilian defense and relief. The meeting will also mark the 30th anniversary of the International Civil Defense Organization which was established in 1931 by the French Surgeon-General Saint-Paul. As a special emphasis upon civilian defense, the Hungarian Minister of Defense issued a decree that all men between 14 and 55, and all women between 14 and 50 have to undergo 60 hours of *civil defense training*.

An English practitioner wished to see the status of *general medical care in all European countries* and to compare it with the conditions in his own country. He had an opportunity to do so last fall, by spending a week each in Holland, Denmark, and Sweden. He selected these countries as being the most similar in medical conditions to his own land. All have a Western European outlook and culture, and all are industrial and agricultural countries. Some form of medical insurance exists also in all three. Only in Sweden is it compulsory and it includes the whole population. In Holland and Denmark only those earning less than approximately $2000 join the medical insurance scheme (this means about 75% of the population). Private practice still accounts for more than 25% of the work of the general practitioner. General medical care is given by the doctors with whom the patients register in Holland and in Denmark. In Sweden, the patient has to pay the doctor but then he claims back 75% from the administration of the "sick clubs" or of the "sick funds." The hospital care is mostly free, but in Holland the free care is only for 70 days. Most of what the patient has to pay is for drugs. Only a few "life-saving" drugs are free in Holland and Denmark, while in Sweden the patient pays about 50% of the prescriptions' costs.

There are ca. 7,000 *physicians in Holland* (1:1500 ratio), 5,000 doctors in Denmark (1:900), and 6,500 in Sweden (1:1,200). In some parts of Sweden the doctor-patient ratio is very low: 1:10,000. The medical profession is well organized in all these countries. But *general practice* in the "English" sense exists only in Holland and Denmark. The doctor works independently from his own premises with the minimum interference from anyone. He arranges his own routine work and he has the closest relations with his patients. Denmark has no outpatient departments, and thus the physician is encouraged to investigate his patients very fully and to seek private consultant advice before the patient is admitted to hospital. But, in Sweden there is no general practice in the English (or American) sense. The Swedish system of medical care is based on the principles of free choice of any physician by the patient at any time and on free access by the public to hospitals. The patient can be under the care of more than one doctor at

the same time. In the large Swedish towns most doctors are "specialists," but the vast majority of them have no access to any beds in hospitals. In the Swedish country the physicians are a mixture of public health officers and general practitioners, who organize all local preventive care, too.

In Holland and Denmark, the young doctors enter into general practice by *buying goodwill. The cost of practice* is about one and half times its annual income. In Sweden, the doctor puts out his sign, while the district doctors are appointed by the State. In Holland and Denmark, the doctors work from premises which have to be improvised for the medical practice. In Sweden, the premises are specially built by local committees. Most doctors employ secretary-nurses who are specially trained for their positions; they do the bookkeeping, make diagnostic tests, dressings, injections. In Sweden, the nurses are employees of local authorities. The gross income of the doctors varies from $13,000 to $18,000, but in England it is only an average of $9,000.

The *main clinical problems* in these countries are more social than medical, and they are related to the *care of old people, the chronic sick, and the psychiatric cases.* Sweden experimented with the banning of these patients from the hospitals by paying the relatives about $12 a week to look after these patients at home. Alcoholism is a very serious problem, especially in Sweden where special clinics for alcoholics treat 5,000 patients (8 pro mille of the adult population) in Stockholm each year. The Swedish abortion clinics also received a great deal of publicity. For instance, in 1959 there were 1,300 legal abortions carried out in Stockholm compared with 10,000 births.

In the United Kingdom, the "Teddy Boys" represent the symbolization of juvenile delinquency. This has greatly increased in recent years, and besides the boys there are also some "Teddy girls" to increase the *English statistics of crime.* In 1958, 51,000 offenses were committed by juveniles, including simple theft (61%), breaking and entering (25%), assault and murder (2%). A member of the London County Educational Board said that some of the young delinquents are victims of their environment and of circumstances, and others are sick, biologically and physically. In the majority, both factors are involved, and the doctor and social worker together have to find the necessary distinctions. "Teddyism" is unhealthy because it is the expression of a *social and cultural blind alley.* The parents of these young people feel satisfied with beer and television; the young people are yearning after a more cheerful life. So they go out into the street, gather around juke boxes and slot machines because they have nowhere to go and no one to confide in. From the mediocre and hygienic uniformity of their neighborhood, town, county, their only escape is the movies whose only sure system of values thus far is force, money, and sex. Teddyism is the manifestation of an England which just recently achieved its social evolution, yet did not find a way to its cultural revolution.

The large cities of the world have many different inhabitants, including also *rats.* In certain international harbors, the number of rat inhabitants is equal or larger than the number of human beings. From a public health point of view, the health status of all inhabitants of a great city is very important. A Parisian physician made a special study of the health of the rats in his city, and found that, generally, the Parisian rats enjoy good health; only some of the older ones, which weigh more than 300 grams, had abscess of the lungs, or of the perirenal tissues, encysted parasites, small inflammatory lesions of the liver. None of them (in a sample of 500 rats) manifested any sign of plague either anatomically or serologically. Yet, 20% of the animals were carriers of *Leptospira ictero-hemorrhagica.*

According to the *demographic statistics of Italy,* in the first eight months of 1960, 326,803 persons died in that country, which is about 7% higher mortality rate than in the preceding year. Among the chief causes of death the diseases of the respiratory system (24.8%) are in the first place, followed by

the diseases of the liver and biliary tract (12.4%), degenerative diseases of the heart (13.3%), other circulatory diseases (12.2%), malignant tumors of the intestines (10.3%), and traffic accidents (4.9%). The Italians, and especially the University of Bologna, were very much embarrassed by the world-wide announcement of the Press that a member of the Bologna Medical Faculty, called Daniele Petrucci, produced the *artificial fecundation of a human ovum.* The Faculty sent a letter to the Rector of the University, stating that these experiments were made outside the University, and they are not scientifically documented and recorded. The Rector, therefore, should defend the good name of the institution in view of the farcical and *chimeric experiment of Petrucci.*

The *Italian medical profession* again became alarmed at the health care of the 50 million Italians. There are almost 78,000 physicians, which is a ratio of 1 physician to 645 inhabitants. This ratio becomes 1:301 in the Province of Roma, and 1:245 in the Eternal City itself which has 8,169 physicians for 2 million people. If we consider that many Italians are in the Social Insurance system, and receive free medical care, then the situation of free medical practice in Italy appears to be desperate.

The *highest hospital in Asia* will be perched at a height of 14,000 feet above sea-level at Leh *in Ladakh.* It will be a 200-bed hospital for the Indian Army; it will have completely modern equipment, and may be expanded to a 400-bed hospital. Part of the medical equipment will be carried to the hospital on a newly constructed road, but much will need an air lift. It was expected to start functioning in July of the current year.

Will there be a *war of the Arctics?* No one knows. But it seems that the territory of the Antarctic is safe, at least for 34 years. Twelve nations, including the U.S., and the U.S.S.R., have signed a treaty providing that Antarctica shall continue forever to be used exclusively for peaceful purposes. The treaty also outlaws nuclear explosions as well as the dumping of radioactive wastes near *the "Seventh Continent."* The pact is supposed to remain in force indefinitely, but none can withdraw before the year 1994. Meanwhile, the world-wide efforts at the studying of the Antarctic region continue.

Thus, for instance, Argentina created (in 1951) the *Argentina Antarctic Institute,* a scientific and technical organization. It is under the supervision of the Navy Department for the study of the Antarctic from every point of view. The Institute, which is located in Buenos Aires, includes in its sphere of research, biology, human physiology and microbiology. It has a number of laboratories, a cold chamber with a temperature down to −22°C, fire-proof archives, etc. The Institute dispatches field groups to the Antarctic, with scientists and technicians, whose task is also the development and trial of various methods of polar technic related to *transportation, nutrition, clothing, life, equipment and communications.* Liaison is maintained with similar organs of the U.S., and with other international organizations. Some of the scientific works include the observation of *human reactions in the Antarctic surroundings,* the study of polar animals for the determination of their possible Strontium^{90} content, analysis of fecal specimens, isolation of lower fungi and bacteria from the air on special culture media. The Institute also operates the *Ellsworth Scientific Station* which was installed in 1957 by the U.S., and transferred to Argentina for further administration and management. This station is also engaged in human physiological studies.

The Mathematics Institute of the Ukraina Academy of Sciences has constructed an *electronic computer for the diagnosis of heart diseases.* The "memory" of this machine records 110 symptoms of heart diseases. These symptoms are in various combinations, and each combination would represent a particular disease. When the machine is questioned about a special combination of the heart symptoms, in a few seconds it will light up a red light at the corresponding diagnosis. Actually, the computer points out five different diagnoses in the order of their probability.

In 1960, the government of *Greece* ratified by a royal decree the statute of the *International Hippocratic Foundation.* This foundation wishes to disseminate and cultivate the ideal of medicine as conceived and practiced by Hippocrates, of Cos, a few thousand years ago. It wishes to publish the writings of the Father of Medicine, and other manuscripts related to the Hippocratic culture. Plans are also made to hold an international *medical olympiad every five years,* and to recreate at Cos the ancient "school" of Hippocrates as a component of an international medical center.

A letter to the Editor of the Canadian Medical Association Journal by a former member of the medical newsmagazine, *M.D. of Canada,* (J. O. Godden) is a serious criticism of this paramedical publication, explaining the writer's reasons why he resigned from his appointment as an editor. *M.D. of Canada* is published by the M.D. Publications, Inc., of New York, whose president physician was named in connection with the scandal that developed about the Antibiotic Division of the U.S. Food and Drug Administration last year. It seems that on this account other members of the American medical profession also abandoned their editorial-board appointments of *M.D. Medical Newsmagazine.* The writer of the editorial letter believes that these "medical newsmagazines" serve no serious professional purpose. The critical reader might be annoyed by the pretense that the "pasticcio of medical history, literary and social vignettes and sex is the actual cultural milieu of the physician."

Medical nomenclature, or the dictionary of genetics, was lately enlarged with a new term: "the *Philadelphia chromosome,*" also symbolized as *Ph,* which is an abnormal chromosome found in a number of cases of chronic myeloid leukemia. It is one of the four smallest chromosomes (pairs 21 and 22) with about half its substance missing. The term was chosen because the abnormal element was first noted in a laboratory at Philadelphia.

Another new medical term is *"television epilepsy."* Since 1952, a gradually increasing number of instances have been reported in which a television set provided the *epileptigenic stimulus* that triggered the start of convulsions in susceptible individuals. The stimulus is highly specific; the seizures do not occur unless the susceptible persons are exposed to a brightly illuminated relatively slowly flickering screen at close proximity to their eyes, in a darkened room. Characteristic is that the seizure sets in while the patient is bending over the television set adjusting the controls and watching a flickering image on the screen. Epilepsy now joins the increasing number of tribulations of Mankind which can be attributed to the television set! . . . Multa paucis!

NOTES

Timely items of general interest are accepted for these columns. Deadline is 1st of month preceding month of issue.

Department of Defense

Senior Medical Advisor—FRANK B. BERRY, M.D.

Deputy Ass't Sec'y of Defense (Health and Medical), Off. Ass't Sec'y of Defense for Manpower—EDW. H. CUSHING, M.D.

AFEB EXECUTIVE SECRETARY

Colonel Charles H. Moseley, MC, a graduate of the Vanderbilt University School of Medicine, who holds both Master and Doctorate degrees in Public Health (Harvard) has assumed the position of Executive Secretary of the Armed Forces Epidemiological Board.

The Board, composed of civilian physicians and scientists, provides advice to the three Surgeons General on research in infectious diseases.

Colonel Moseley succeeds Colonel John Rizzolo, who has been assigned to the Philippines.

The AFEB Executive Secretary will have his office in the Office of the Surgeon General of the Army.

Army

Surgeon General—LT. GEN. LEONARD D. HEATON

Deputy Surg. Gen.—MAJ. GEN. THOMAS J. HARTFORD

PREVENTIVE DENTISTRY

Preventive Dentistry is the order of the day. Major General Joseph L. Bernier, Chief of the Dental Corps, has made the matter a project of the first order and to that end has organized the Army Medical Service Advisory Committee on Preventive Dentistry.

Members of the Committee are: Dr. John C. Brauer, Dean of the School of Dentistry, University of North Carolina; Dr. Hamilton B. C. Tobinson, Dean of the School of Dentistry, University of Kansas City, Mo.; Dr. Joseph C. Muhler, Professor of Basic Sciences, Indiana University; and Dr. Irving Glickman, Professor of Peridontology, Tufts University School of Dental Medicine.

The first course in Preventive Dentistry was recently held at the Walter Reed Army Institute of Research. The exhibit shown depicts the importance of soldiers in the field keeping their teeth at least as clean as their eating utensils.

A Preventive Dentistry Division has been established in General Bernier's section of the Surgeon General's Office. This is to be

U. S. Army Photo

BRIG. GEN. CLARENCE P. CANBY, Director of Dental Activities at the WRAMC (recently moved to Brooke Army Medical Center); MAJ. GEN. JOSEPH L. BERNIER, Chief of the Army Dental Corps; COL. THOMAS A. MCFALL, DC, USA, Director of Div. of Dentistry, ARAIR; and CHAPLAIN WALTER G. MCLEOD of Walter Reed General Hospital.

headed by Colonel Russell Sumnicht, DC, USA.

We have high hopes that some very important measures will be brought to the attention of the American people for surely Preventive Dentistry must start in early childhood. The military forces see the results of the years of neglect of such measures.

NEW COMMANDER AT BAH

Brigadier General George M. Powell, MC, a graduate (1932) of the Washington University School of Medicine, recently became the ninth Commander of Brooke General Hospital since it was so named in 1942. This hospital is a unit of the Brooke Army Medical Center, Fort Sam Houston, Texas, commanded by Major General John Bohlender.

A specialist in internal medicine, General Powell began his military service at the hospital he now commands. Recently he was commander of the Madigan General Hospital. He has published articles on internal medicine, particularly on studies he made on hemorrhagic fever as a result of experience with this disease in the Far East.

NAMED COMMANDER AMSCDG

Colonel Edwin S. Chapman, MC, has been named Commander of the Army Medical Service Combat Developments Group, at its new home, Brooke Army Medical Center, Fort Sam Houston, Texas.

This Group will prepare studies on the medical services of the future. To provide the military forces with the high type of medical care that has been given in the past requires considerable thought and pre-planning for all eventualities that may occur. The lessons learned from past combat must always be kept in the present; they must be projected to the future, and the new developments must be carefully analyzed and their relation to future medicine must always be considered. Such will be the responsibility of Colonel Chapman and his group.

His training well qualifies him for the position: Task Force Surgeon in Mid-Pacific in early months of World War II; instructor Medical Field Service School; graduate Command and General Staff College; Assistant Surgeon, Army Ground Forces; Medical Advisor, Military Mission to Peru; graduate, Armed Forces Military College; graduate, Army War College; senior Medical Advisor, Korean Military Advisor Group, and recently Director of Department of Military Sciences, Medical Field Service School.

Colonel Chapman is a Life Member of the Association of Military Surgeons of the U.S.

MILITARY SCIENCE DIRECTOR

Lt. Colonel Richard H. Ross, MC, has succeeded Colonel Edwin S. Chapman as Director of the Department of Military Sciences at the Medical Field Service School, Fort Sam Houston, Texas.

Colonel Ross was commissioned in the Army Medical Corps in 1945. He served as Division Surgeon, 25th Infantry Division, in Korea in 1951-52.

HONORED

Lt. Colonel William A. Boyson, MC, USA, a recent graduate of the U. S. Army Command and General Staff College, Fort

U. S. Army Photo

LT. COL. WILLIAM A. BOYSON

Leavenworth, Kansas, received the School's *Commandant's Award for Effective Military Writing.* The presentation of the award was made by General Lyman L. Lemnitzer, Chairman of the Joint Chiefs of Staff, at the graduation exercises.

Colonel Boyson will become a member of the faculty of the college. He is a graduate of the Gettysburg College, Pa., the School of Medicine at the University of Pennsylvania, and in 1957 received a master's degree from the Baylor University Graduate School of Medicine.

ASSIGNMENT FIRST ARMY

Lt. Colonel Stephen D. Berardinelli, MC, has been appointed Chief, Professional Services Division, First U. S. Army Medical Section, Governors Island, New York. He has been Commanding Officer of the U. S. Army Dispensary at 90 Church St., Manhattan, since his return from Korea in 1959.

TO ATTEND LOGISTICS COURSE

Lt. Colonel Ben F. Peake, MSC, USA, is the first Medical Service Corps Officer chosen to attend the advanced logistics course at the Air University, Wright Patterson Air Force Base, Ohio, which begins on September 5. This is a one year course.

AWARDED HOFF MEDAL

Lt. Colonel Ralph H. Forrester, MC, USA, was awarded the coveted Hoff Medal at the graduation exercises of the nine-month course in Military Medicine and Allied Sciences, Walter Reed Army Institute of Research. Presentation was made by Colonel Edwin J. Pulaski, MC, USA, Deputy Director of the Institute.

Colonel Forrester's principal research report was entitled "Iron Absorption. Observations on the Influence of Phlebotomy in Normal Human Subjects."

Other graduates who were presented diplomas by the course director, Lt. Colonel Paul E. Teshon, were: Majors Warren H. Brune, Nicholas F. Conte, Niklaus J. Keller; Captains Billy P. Darby, Jr. (USAF) and James W. Ransone.

MEDAL AWARD FOR NURSES

For the past couple of years active duty and retired Army Nurses have been contributing to a fund to provide a medal to the individual graduating from the Advanced Military Nursing Course who best exemplifies the ideal military nurse.

Such a medal now exists.

Under the career guidance program, each Regular Army and Reserve nurse on active duty is sent to Brooke Army Medical Center to take this 5-month course in Advanced

Armed Forces Inst. of Path.

OBVERSE OF MEDAL

Armed Forces Inst. of Path.

REVERSE OF MEDAL

Military Nursing some time between their third and seventh year of service. Emphasis is on military planning and supervision, staffing, teaching, and project study to prepare them for the progressive military nursing responsibilities accorded career officers in the Army Nurse Corps.

NURSE CORPS MEDAL AWARD

Captain Angeline Hennek, NC, USA, of Plymouth, Michigan, received the first Army Nurse Corps Medal awarded to the top-ranking student in the Advanced Military Nursing Course at the Medical Field Service School.

Colonel Ruby Bryant, former Chief of the Army Nurse Corps, and recently Director of Nursing Activities at Brooke Army Medical Center, made the presentation of the medal. She retired from military service on June 30, 1961.

LINE-MEDIC OFFICER JOINS SGO

Major Maurice G. Patton, MC, no relation to the World War II General, but an officer of his Division, has been assigned to the Office of the Surgeon General, Preventive Medicine Division.

Major Patton was wounded in action, decorated for gallantry, and later returned home to study medicine at the University of Arkansas School of Medicine, Little Rock. After receiving his medical degree in 1952 he entered military service.

Major Patton wears the Silver Star, Purple Heart, Bronze Star, and Distinguished Unit Citation. He is a Diplomate of the American Board of Preventive Medicine.

ARMY REORGANIZATION

The Army's divisions will be reorganized beginning in early 1962. The National Guard and Reserve divisions will start their reorganization at the same time but that part of the project will be phased over a longer period of time.

The change provides for four types of divisions: Infantry, Armor, Airborne and a new type, Mechanized.

The four new types of divisions will have a common division base. In each division will be three brigade headquarters. The common division base will have a strength ranging from 6,000 to 7,200. Each division will have from six to 15 battalions, ranging in size from 750 to 850 men. The average division will have approximately 15,000 men. Under the support command there will be one Medical Battalion.

The reorganization will provide the division with flexibility, mobility, and improved firepower.

Navy

Surgeon General—REAR ADM. EDWARD C. KENNEY

Deputy Surgeon General—REAR ADM. ALLAN S. CHRISMAN

ASSUMES COMMAND MEDICAL SCHOOL

Captain John S. Shaver, MC, USN, has assumed command of the U. S. Naval Medical School at the National Naval Medical Center, Bethesda, Maryland. He succeeds Captain Malcolm W. Arnold who has retired.

Captain Shaver a graduate of the University of Texas School of Medicine (1937) entered the Navy Medical Corps in 1939. His specialty is pathology.

RETIRED

Captain Malcolm W. Arnold, MC, USN, who has been Commanding Officer of the U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland, retired on June 30 after completing more than 30 years of active duty.

Captain Arnold commenced his career in naval medicine upon graduation from the Johns Hopkins University School of Medicine in June 1931. His career was highlighted by a four and one-half year tour of duty in the Bureau of Medicine and Surgery where he served as the Head of the Training Branch and later Director of the Professional Division.

Captain Arnold will be retained on active duty for a time in the Bureau of Medicine and Surgery. There he will be Director of the Publications Division and Naval Medical News Letter Liaison Officer.

PROMOTION

Captain Alberta Burk, NC, USN, was recently promoted to that rank. She is the fourth officer in the Nurse Corps to be elevated to the rank of captain.

Captain Burk whose home is in Independence, Iowa, is Deputy Director of the Navy Nurse Corps. She entered Navy Nurse Corps in 1935.

AWARD PRESENTED

Lieutenant Donald E. Topscott, MSC, USN, was presented the Surgeon General's Annual Award for scholastic achievement at the graduation of thirty-four officers following an intensive ten-month course at the U. S. Naval School of Hospital Administration, National Naval Medical Center, Bethesda, Maryland, June 15.

Presentation of the award was made by Rear Admiral A. S. Chrisman, Deputy Surgeon General.

The Commanding Officer of the School is Commander Calvin F. Johnson.

Air Force

Surgeon General—MAJ. GEN. OLIVER K. NIESS

Deputy Surg. Gen.—MAJ. GEN. RICHARD L. BOHANNON

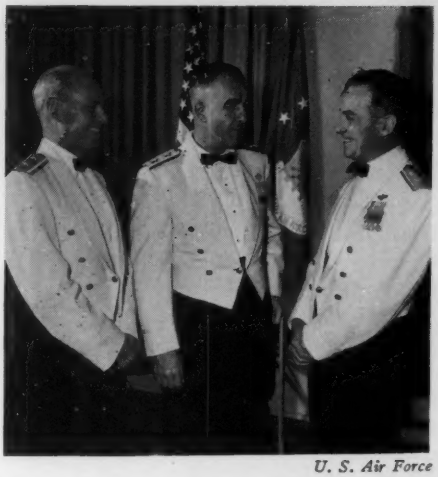
MEDICALLY SPEAKING

The Incoming Deputy Surgeon General of the Air Force and the Outgoing Deputy met with the Surgeon General at the Hail and Farewell Party recently.

Major General Richard L. Bohannon came to Washington and Major General John K. Cullen has gone to Germany.

A GOOD IDEA

Revive the spirit of the Fourth of July! Not with firecrackers, booze, parades, or oratorical nonsense by flag waving, emotional stirring verbosity, but by down to earth methods, possibly through the radio, T-V, cards, banners and any other means that will bring to the American people the things that this country really stands for in this world. If our own people know (and how many of them really do?) the rest of the world will eventually know. There are few oases of freedom as we know it in the rapidly expanding world desert which is drying up the dignity of man.



U. S. Air Force

MAJ. GEN. BOHANNON, MAJ. GEN. O. K. NIESS, Surgeon General, and MAJ. GEN. JOHN K. CULLEN.

Colonel Carlos F. Schuessler, Dental Surgeon of the USAF Aerospace Medical Center, Brooks Air Force Base, Texas, believes that the Fourth of July is a good time to review the principles which our American antecedents fought and died for.

He developed a Fourth of July postcard and gave it wide distribution. The inside inscription is impressive: "Everything we have —everything we stand for in this troubled world—we owe to the liberty secured for us by the founders of our blessed nation. On this 185th Anniversary of American Independence, I invite you to join me in giving honor as our forbears did to the architects of our good fortune."

This is one idea. Let's think about this for next year.

Public Health Service

Surgeon General—LUTHER L. TERRY, M.D.
Deputy Surg. Gen.—JOHN D. PORTERFIELD, M.D.

NIH ADDS BUILDING

A new building, the first which the National Institute of Dental Research can call its own, was dedicated recently at the NIH Center, Bethesda, Maryland.

Dr. Francis A. Arnold, Director, National Institute of Dental Research, and Dr. John Knutson, Chief Public Health Service Dental Officer, collaborated as presiding officers at the dedication.

DENTAL HEALTH CENTER

A National Dental Health Center has been established on the grounds of the Public Health Service Hospital, San Francisco.

This Center will provide facilities for applied research in the prevention and control of dental diseases and for training dental public health workers in the application of research findings.

Dr. George Nevitt will direct the Center and its training activities. Dr. John Greene will head the epidemiology program.

PUBLICATION

The Scientific Directory 1961 and Annual Bibliography 1960 of the National Institutes of Health, Bethesda, Maryland, was recently published as PHS Bibliography Series No. 34.

This 144-page book (with index) gives the names of those in the Institutes and the material that has been published by the sections.

Copies may be obtained from the U. S. Government Printing Office, Washington 25, D.C., for 45¢ a copy.

APPLIANCES

Hearing Aids. About 1,161,000 people in the U.S. have hearing aids. This represents only a fifth of those having hearing impairments.

Wheel Chairs. About 253,000 people have wheel chairs. Over 50 percent of these persons are confined to the house.

Braces. About 690,000 braces are worn by people in the U.S. About 201,000 are leg or foot braces, of these 41 percent are worn by children under 15 years of age as a result of poliomyelitis or congenital defects.

Artificial Limbs. Approximately 139,000 persons in the U.S. use artificial limbs; 94 percent are males. About 76 percent of the total number use an artificial leg or foot.

These figures are obtained from a recent report "Distribution and Use of Hearing Aids, Wheel Chairs, Braces, and Artificial Limbs, U.S. July 1958-June 1959" (PHS Publ. No. 584-B27). Copies of this report are available from Superintendent of Documents, Government Printing Office, Washington 25, D.C., at 25¢ a copy.

HIGHLIGHTS OF RESEARCH

Allergy and Infectious Diseases 1960 (Public Health Publ. No. 829) shows some of the research done in the field of allergy and infectious diseases. This brings one up to date for the year 1960.

Copies may be obtained for 30¢ each from the Government Printing Office, Washington 25, D.C.

URANIUM MINING HAZARDS

Lung cancer and complications of silicosis are occurring in excessive numbers in uranium miners according to a recent report of the Public Health Service.

For the complete report, *Governors' Conference on Health Hazards in Uranium Mines* (PHS Publ. No. 843), write to Public Health Service, Washington 25, D.C.

BIBLIOGRAPHY ON TOXOPLASMOSIS

A bibliography of the literature (1956-September 1960) on toxoplasmosis has been compiled by Dr. Dorothy Bocker, of the National Library of Medicine, Washington 25, D.C. Copies are available.

Veterans Administration

Chief Medical Director—WILLIAM S. MIDDLETON, M.D.

Deputy Chief Med. Dir.—H. MARTIN ENGLE, M.D.

HONORED

Dr. Lee D. Cady, Manager of the Veterans Administration Hospital, Houston, Texas, will receive The Physician's Award of 1960 by the President's Committee on Employment of the Physically Handicapped. Announcement was recently made by General Melvin J. Maas, Chairman of the Committee.

The award will be presented at the annual banquet of the Congress of Industrial Health, American Medical Association, Denver, October 3.

"Like most awards," Dr. Cady says, "it really belongs to my associates in Houston and throughout Texas who have loyally sustained the Employ-the-Handicapped Program—but I'm very happy to represent Texas in its receipt."

Dr. Cady commanded the 21st General Hospital through Africa, Italy and France in World War II.

HOSPITAL NURSING BOOK

A Guide for Studying The Utilization of Nursing Service Personnel in VA Hospitals has been distributed to Veterans Administration Hospitals for study in the utilization of nurses' time.

This work was developed with the aid of Columbia University. Copies will soon be available from the Government Printing Office.

This book should be of particular value in studying the activities of ward nursing staffs.

PITUITARY AND CANCER

The relationship of the pituitary gland and the spread of cancer was a subject of discussion at the International Symposium at the Detroit Institute of Cancer Research held at Henry Ford Hospital recently.

Drs. Bernard and Edwin Fisher of the University of Pittsburgh School of Medicine and the Pittsburgh Veterans Hospital discussed their work in which they found that the removal of the pituitary gland in rats inhibited the spread of cancer cells to the liver.

Dr. Edwin Fisher about six years ago demonstrated the presence of circulating cancer cells in the blood stream.

RADIOACTIVE HIPPURAN

A new radioactive agent, radioactive hippuran, is said to differentiate between high blood pressure caused by kidney disease and that of unknown origin.

Manuel Tubis, chief biochemist of the radioisotope service at the Los Angeles Veterans Administration, synthesized the new radioactive agent.

Clinical investigation of this hippuran is being made by Doctors W. H. Blahd and R. A. Nordyke.

There is some promise that the high blood pressure cases due to kidney impairment may yield to surgery. Pilot studies seem to indicate this.

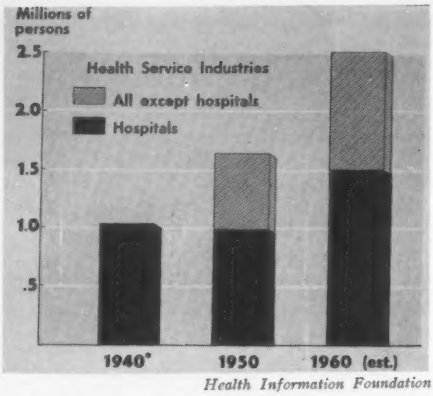
Radioactive hippuran is safe and simple to use by intravenous methods. Radiation detectors can determine the amount of the hippuran in the kidneys and thus give an indication of the impairment.

Miscellaneous

MANPOWER IN HEALTH

The number of persons employed in the "health service industries" was reported at just over one million in the U.S. Census of 1940. A decade later, however, the comparable figure had risen to over 1.6 million. Although comparable data from the U.S. Census of 1960 are not yet available, present indications are that the figure may be around 2.5 million persons.

There are over 230,000 physicians in the United States, double the number of 1900. Yet the ratio of physicians to population has fallen from 157 per 100,000 in 1900 to 133 at present. It is predicted that there will be a decline to about 130 per 100,000 by 1970 and 126 in 1975 if the trend continues.



Health Information Foundation

NUMBER OF PERSONS EMPLOYED IN THE HEALTH SERVICE INDUSTRIES, U.S.

The number of dentists reported in 1900 was just under 30,000. There are now slightly over 100,000, with about 84,500 in private practice. The ratio has remained at about 57 per 100,000 since the war years.

There has been an increase in the number of nurses, the ratio per 100,000 population rising from 55 in 1910 to 282 in 1960.

COUNTERFEIT AND MISLABELED DRUGS

The Food and Drug Administration is vigorously pursuing the campaign against counterfeit and mislabeled drugs that have been on the market.

There exists some "fly-by-night" concerns that have bought up samples of drugs mailed to physicians, then reassemble these in containers, put on labels, and sell the products. Mix-ups have occurred. Some of these are very serious. In a number of other cases there has been pure counterfeiting. Drugs should be purchased through recognized trade channels. When in doubt it might be wise to check with the Better Business Bureau or the Chamber of Commerce. But is it not best to deal with your pharmacist whom you should look to for advice on purchasing drugs?

FOLIC ACID

Vitamins sold over the counter must not contain more than 0.4 milligram of folic acid for the daily dose. Seizure of such vitamins is being made by the Food and Drug Administration.

Any other preparations containing more than the above amount must be sold only on prescription.

CASE FOR DIAGNOSIS

The diagnosis of the case recorded on page 619 is cystic craniopharyngioma. Neither calcification within the tumor nor erosion of the sella turcica was present, though they are usually characteristic features of this lesion.

CIVIL DEFENSE GIFTS AND CERTAIN EXPENSES DEDUCTIBLE

The Internal Revenue Service has ruled that "Contributions or gifts to a civil defense organization, organized under federal, state, or local law, are deductible on federal income tax returns by taxpayers who itemize their deductions."

Necessary travel expenses for attendance at meetings, exercises, and the like are deductible. The construction of a bomb shelter or the supplies that may be stored for use in a disaster are *not* deductible items.

NEW ITEMS

In Britain an iron lung has been developed which turns the patient through 180°. It was recently shown at the International Hospital Equipment Exhibition in London.

Also in Britain there has been developed a low-priced mattress which has proved itself to be hygienic, waterproof, and virtually nondestructible. It has been tried under practical conditions in general and mental hospitals.

UROLOGY AWARD

The American Urological Association offers an annual award of $1,000 (first prize of $500, second prize $300, and third prize $200) for essays on the result of some clinical or laboratory research in Urology. Competition is limited to Urologists who have been graduated not more than ten years, and to hospital interns and residents.

Further information can be obtained from the Executive Secretary, 1120 North Charles St., Baltimore 1, Md.

MEETING

An Interim Congress of the Pan American Association of Ophthalmology will be held in Lima, Peru, January 28-February 3, 1962. All ophthalmologists are invited to attend.

Titles and abstracts of papers for consideration should be sent to John M. McLean, M.D., 525 East 68th St., New York 21, N.Y., by October 30.

AMERICAN COLLEGE OF SURGEONS

The 47th Annual Clinical Congress of the American College of Surgeons will be held in Chicago, October 2-6.

Dr. I. S. Ravdin of Philadelphia is the outgoing president. Dr. Robert M. Zollinger, Ohio State University College of Medicine is the incoming president. He will speak on "Surgical Tithing."

BOOK

Uniformed Services Almanac—1961 edition—is a paperback, 8½ x 5¼, 146-page book packed with information for commissioned officers and enlisted men of the U. S. Military Services.

This book compiled and edited by Lee E. Sharff, in association with Wayne Hawkins and Joseph Young, can be obtained for $1.00 a copy. Address: Uniformed Services Almanac, P.O. Box 400, Washington 4, D.C.

SEEKING IDEAS?

The *Patent Abstract Series* describes thousands of Government-owned patents that are available for license at no charge by private firms and individuals for non-exclusive use.

Further information may be obtained on this by asking for release No. OTS 61-453, Business and Defense Services Administration, Department of Commerce, Washington 25, D.C.

SUGAR IN DEVELOPER

A small amount of sugar improves x-ray film developer according to two Kodak scientists, H. Murray Clear and Nancy H. King.

About seven ounces per quart of developer is sufficient to extend the range of the various monitoring films used for radiation recording.

The report was made at the Health Physics Society in Las Vegas, Nevada, June 14.

New York Chapter

More than 140 members and guests attended the spring meeting of the New York Chapter of the Association of Military Surgeons, at which Captain F. Kirk Smith, MC, USN, spoke on "Some Interesting Aspects of Aerial Space Medical Research." He is Director of the Aviation Medical Acceleration Laboratory, U. S. Naval Air Development Center, Johnsville, Pa.

A cocktail party for members and their guests was sponsored by the New York Chapter during the Annual Meeting of the American Medical Association in New York. This proved to be an enjoyable event where many who were not able to be together during the convention could meet and discuss some of the old and new problems facing the military services.

New Members

Carlos Mena, M.D.
Lieutenant Mary Anton, NC, USNR
1/Lt. Nicholas Waldimar Holowecky, MSC, USAR
LCdr. R. L. Cannon, Jr., MSC, USN
Capt. George Z. Steuer, MC, USA
Lt. Col. Raffaele Suriano, DC, USA
Captain Donald E. McIntosh, MC, USA
Lt. Clyde William Jones, MC, USNR
Cdr. Don E. Kelly, MC, USNR
Lt. Casimer A. Passalino, DC., USN
Capt. Claire A. Leddy, ANC, USAR
LCdr. John D. Bateman, MC, USNR
Commander Karl A. Lofgren, MC, USNR
Brig. General Douglas B. Kendrick, MC, USA
Cdr. Florence M. Frazier, MSC, USN
Lt. Col. Venona M. McGuire, ANC, USA, Ret.
Lt. (jg) John P. Blake, MSC, USN
Col. John T. Morrison, USAF, MC
1st Lt. Max Lee Ronis, Pa. NG

Major Bernard Joseph Ronis, MC, AUS
Capt. Alan Bruce Cooper, MC, USAF
Captain Robert W. Kelly, USAFR, MSC
1st Lt. Stanley J. Hollander, MC
Captain Edward A. Jones, MC, USN
LCdr. Robert A. Conner, MC, USN
Lt. Gail Avrum Magid, MC, USNR
1st Lt. Frank L. Kardos, MC, USA
Lt. Thomas H. Birney, DC, USNR
J. C. McCarty, M.D. (formerly Col. Med. Corps, AUS)
Captain Alfred A. Friedman, USAF, DC
Capt. Phillip P. Fried, MSC, USAR
Maxwell L. Littman, M.D. (formerly Lt. Col., MSC, AUS)
Major Frode Jensen, MC
Colonel Angé S. Naples, MC, USAR
Colonel Vincent D. Francis, MC, USA
Colonel Carl Taylor Dubuy, MC, USA
Maj. Corinne R. Hauck, USAF, NC
Captain Callista J. Lillard, ANC
Captain James B. Potin, MSC, USA

MEMBERSHIP COMMITTEE

Commander Calvin F. Johnson, MSC, U. S. Navy, Chairman
Mr. George F. Archambault, U. S. Public Health Service
Commander Burdette M. Blaska, NC, U. S. Navy
Colonel Jesse W. Brumfield, MSC, U. S. Army
Lt. Col. Nathan Cooper, U. S. Air Force (MSC)
Lt. Col. V. Harry Adrounie, USAF, MSC
Mr. Vernon O. Trygstad, Veterans Administration

Honor Roll

Since the publication of our last list, the following sponsored one or more applicants for membership in the Association:

Thomas F. Furlong, Jr., M.D.
Lt. Col. Carl J. Schopfer
Captain E. E. Hedblom, MC, USN
Lt. Joseph H. Miller, MC, USNR
Capt. James F. Cramer, USAF, DC
Lt. Col. Edward A. Barrett, MC, USAR
Dr. O. H. Fulcher
Lt. Col. Evelyn M. Bedard, USAF, NC
Lt. Col. Martin A. Pfotenhauer, MC, USA
Capt. Charlotte E. Comley, ANC, USAR
Cdr. Joseph R. Eastman, Jr., MC, USNR
Maj. Ruth M. Miller, MC, USAR

Deaths

DE AGUIAR, Grace McNee Heltman, Major, U. S. Air Force, Medical Specialist Corps, died at Walter Reed General Hospital on May 13.

Major de Aguiar was a graduate of the Physical Education Department of Ithaca College, New York, and took her physical therapy training at Walter Reed Army Hospital, Washington, D.C. From 1936 to 1943 she was employed as a physical therapist in the New York and New Jersey areas. In 1943, in response to the War Department's need for physical therapists, Major de Aguiar volunteered for duty in the U. S. Army Medical Service. She later transferred to the Air Force Medical Specialist Corps and served as an officer in the Regular component until 1952. At that time she returned to civilian status but continued to serve with the Federal Service at the Veterans Administration Hospital in Albany, New York. In 1957 she was recalled to active duty with the Air Force and served at Lackland Air Force Base, Texas, and Tachikawa Air Force Base, Japan.

Interment was at Delancy, New York.

THOMAS, Robert E., Colonel, Medical Corps, U. S. Army, Retired, died June 2 at Walter Reed General Hospital. He was 73.

Colonel Thomas, a native of Scranton, Pa., was a graduate of the University of Maryland Medical School (1912). He joined the Regular Army in 1917. He also served in France in World War I. In 1950 he retired from the Army.

He landed in France on D-Day plus one and became chief medical officer in the Oise area.

He is survived by his widow, 4740 Connecticut Ave., N.W., Washington, D.C., and two daughters.

Interment was in Arlington Cemetery.

NEW BOOKS

Comparative Epidemiology of the Mental Disorders. The proceedings of the 49th annual meeting of The American Psychopathological Association, held in New York City, February 1959. Edited by Paul H. Hoch, M.D. and Joseph Zubin, Ph.D. 290 pp., illustrated. Grune & Stratton, Inc., New York, London. Price $9.75.

The Practitioner's Handbook. Edited by William A. R. Thomson, M.D. 711 pp., illustrated. J. B. Lippincott Company, Philadelphia. Price $12.50.

Chemical Pathology of the Nervous System. Proceedings of the 3rd International Neurological Symposium held at Strasbourg. Edited by Jordi Folch-Pi. 896 pp., illustrated. Pergamon Press, Inc., New York. Price $20.00.

Hospitals, Doctors, and Dollars. By Robert M. Cunningham, Jr. 268 pp., clothbound. F. W. Dodge Corporation, New York. Price $6.95.

A History of the Nursing Profession in Great Britain. By Brian Abel-Smith, Ph.D. 304 pp., illustrated. Springer Publishing Co., Inc., New York. Price $5.75.

Calderwood's Orthopedic Nursing. 5th Ed. by Carroll B. Larson, M.D., F.A.C.S., and Marjorie Gould, R.N., B.S., M.S. 547 pp., with 343 illustrations. The C. V. Mosby Company, St. Louis. Price $6.50.

The Cardiac Arrhythmias. A Guide for the General Practitioner. By Brendan Phibbs, M.D. 128 pp., illustrated. The C. V. Mosby Company, St. Louis. Price $7.50.

Field Studies in the Mental Disorders. Proceedings of the work conference on problems in field studies in the mental disorders, February 15-19, 1959, under the auspices of the American Psychopathological Association, supported by USPHS, Grant No. 3M-9146, National Institute of Mental Health. Edited by Joseph Zubin, Ph.D. 495 pp. Grune & Stratton, New York, London. Price $6.75.

Heredity in Ophthalmology. By Jules François. Translated from the French edition, *L'Hérédité en ophthalmologie* by Jules François. 731 pp., with 629 figures including 6 in color. The C. V. Mosby Company, St. Louis. Price $23.00.

Abdominal Operations. 4th Ed. by Rodney Maingot, F.R.C.S. (Lond.), with special articles by 36 British and American contributors. 1402 pp., 917 new illustrations included in a total of more than 1800. Appleton-Century-Crofts, Inc., New York. Price $29.50.

The Premature Baby, 5th Edition. By V. Mary Crosse, O.B.E., M.D. (Lond.), D.P.H., M.M.S.A., D. (Obstet.) R.C.O.G. 266 pp., with 42 illustrations. Little, Brown and Company, Boston. Price $7.00.

Progress in Medical Genetics. Vol. I. Edited by Arthur G. Steinberg, Ph.D. 341 pp., illustrated. Grune & Stratton, New York, London. Price $9.75.

Recent Advances in Biological Psychiatry. Vol. III. The Proceedings of the Fifteenth Annual Convention and Scientific Program of the Society of Biological Psychiatry, Miami, June 1960. Edited by Joseph Wortis, M.D. With an Introductory Essay by Paul Hoch, M.D. 241 pp., illustrated. Grune & Stratton, New York, London. Price $9.75.

Medical Pharmacology. Principles and concepts. By Andres Goth, M.D. 551 pp., illustrated. The C. V. Mosby Company, St. Louis. Price $11.00.

Histology. 4th Edition. By Arthur W. Ham, M.B., F.R.S.C., and Thomas Sydney Leeson, M.A., M.D., B.Ch. (Cantab.). 942 pp., with 589 Figure Numbers, including 8 plates in color. J. B. Lippincott Company, Philadelphia, Montreal. Price $11.00.

The Closed Treatment of Common Fractures. 3rd Edition. By John Charnley, B.Sc., M.B., F.R.C.S. 272 pp., illustrated. The Williams and Wilkins Company, Baltimore. Price $10.00.

Eugene Wolff's *Anatomy of the Eye and Orbit.* 5th Edition. Revised by R. J. Last, M.B., B.S. (Adelaide), F.R.C.S. (Eng.). 500 pp., with 438 illustrations, including 54 in color. W. B. Saunders Company, Philadelphia, London. Price $18.00.

Baillère's *Pocket Book of Ward Information.* 10th Edition. Revised by Marjorie Houghton, M.B.E., S.R.N., S.C.M., D.N. (Lond.) 213 pp. The Williams & Wilkins Co., Baltimore, exclusive U. S. agents. Price $2.50.

Hypertension. A Mount Sinai Hospital Monograph. Edited by Milton Mendlowitz, M.D. 156 pp., illustrated. Grune & Stratton, New York, London. Price $6.50.

Essentials of Neurosurgery for Students and Practitioners. By Sean Mullan, M.D. 273 pp., illustrated. Springer Publishing Company, New York. Price $6.75.

Haematin Enzymes. A Symposium of the International Union of Biochemistry organized by the Australian Academy of Science, Canberra. Editors: J. E. Falk, R. Lamberg and R. K. Morton. Two volumes, 680 pp., illustrated. Pergamon Press, Inc., New York. Price $14.00 each vol.

BOOK REVIEWS

THE PHYSIOLOGICAL BASIS OF MEDICAL PRACTICE. 7th Ed. A Text in Applied Physiology. Edited by Charles H. Best, C.B.E., M.A., M.D., D.Sc.F.R.C.S, F.R.C.P. (Canada); and Norman Burke Taylor, V.D., M.D., F.R.S., F.R.C.S., F.R.C.P., M.R.C.S., L.R.C.P. With 28 contributors. The Williams & Wilkins Company, Baltimore. Price $16.00.

The 1961 edition of this classic text in applied physiology continues to be the standard in its field. This is the seventh writing and has been eagerly awaited since the last edition in 1955. Prior to the current volume, the authors performed the near-impossible task of straddling the entire expanding area of physiology as a two-man project. However, in the present edition they have adopted a practice which is becoming more popular in medical textbook authorship and have "farmed out" various sections to men distinguished in selected fields. As a result, this edition is a masterful presentation of the fascinating wonderland of contemporary physiology, quite in keeping with the tradition of its predecessors.

Perhaps the high points of this particular writing are the chapters which have to deal with cardiology. The section on electrocardiography utilizes some of the lucid line diagrams from Barker's textbook on unipolar electrocardiography. One point which I would have liked to have seen mentioned in this section is the Prinzmetal work with regard to the "electrocardiographically silent" area of the endocardium.

The chapters on circulation are written by Dr. Gregg and his associates and demonstrate his usual high degree of clarity in explaining difficult concepts of circulatory dynamics.

If any minor criticism of this nature can be levied at this book, it may be that the hematology chapters leave something to be desired. Several of the pertinent advances in this field could not be found in these pages. For example, I could find no mention of "Erythropietic Factor." There was no reference to platelet (or leukocyte) agglutinins which would seem to be essential in a discussion of the physiology of thrombocytopenia. The chapters on anemias are generally good, but do not include information on the "primaquin sensitive anemias" and the implications of this in hemolytic anemia. There is no mention of the anemias related to defective heme synthesis (i.e., "pyridoxine unresponsive"). Perhaps this information was published too late for inclusion. However, in glancing at the bibliography for the section on the "anemias," it was observed that of the 41 references, only 10 were from the period 1950 on. Throughout the book, the bibliographies are notable in their inclusion of classic works in each given field. However, frequently there seems to be a lack of significant contemporary articles. These are certainly minor flaws.

The text remains the classic work in applied physiology. For the young student experiencing the thrill of exploring the new territories of human physiology for the first time; for the busy practitioner who wants an authoritative explanation of the "why" and "how" things are happening to his patient; for the advanced student who desires background reading before going to the literature in preparation for a research project—this text remains the bed-rock information source. The literary style and editing is excellent. Drs. Best and Taylor have made a major and continuing contribution to the medical library, once again.

MAJ. ROBERT H. MOSER, MC, USA

BEDSIDE MEDICINE. By I. Snapper, M.D. 592 pp. Grune & Stratton, New York and London. Price $14.50.

This is the first edition of a highly practicable, succinct book for students and practitioners of Internal Medicine. Dr. Snapper records his experiences and viewpoint of medicine as he has learned and taught it for fifty years in Amsterdam, Holland and Peiping, China, and then in Chicago and New York.

He insists that a physician must have a wide knowledge of the natural sciences. At the patient's bedside, however, there must be no theorizing. At all times an ethical concept based on an elevated moral law is indispensable. Modern medical scions do not often respect empirical knowledge for diagnosis and therapy; however, Dr. Snapper contends that laboratory procedures must complement, not supplement, clinical studies.

The book is arranged into seventeen chapters, plus an index. An especially outstanding chapter is the one on "Fever of Unknown Origin."

Therapy is mentioned only casually as diagnosis is paramount. Dr. Snapper pleads for roentgen examinations to be done by Radiologists rather than by non-specialists in the field. This is an excellent book for any physicians interested in Internal Medicine.

COL. U. ROBERT MERIKANGAS, USA RET.

HAEMATOLOGY. By R. B. Thompson, M.D., F.R.C.P. 306 pp. J. B. Lippincott Company, Philadelphia and Montreal. Price $6.00.

It is difficult to imagine a better precis of hematology than Dr. Thompson provides in this little book. It is sufficiently detailed and well balanced except somewhat skimpily referenced. It is clinically oriented and altogether an excellent text for training of interns and residents.

COL. WILLIAM H. CROSBY, MC, USA

DIVERTICULITIS. A Monograph. By Sara M. Jordan, M.D., and Russell S. Boles, Jr., M.D. 89 pp., illust. Grune & Stratton, New York and London. Price $4.75.

The authors explain that this monograph deals with the lower part of the intestinal tract, particularly the colon. They state, "Where the words *diverticulosis* and *diverticulitis* are used without localizing the site of the abnormalities, they are usually understood as referring to the colon, where diverticula are most frequently found."

The *Historical Review* section covers almost half of the book. Thus the background of a baffling condition which forms the basis of the book is exhaustive and shows the tremendous amount of work that has been done by many authorities over the years.

Pathogenesis, diagnosis, and treatment of diverticulosis and diverticulitis are presented with comments on each subject by the authors. These comments are extremely valuable as they summarize for the reader the present status of the various topics discussed.

There is an exhaustive bibliography, with an index. Here is an important contribution to the subject of diverticulitis.

R.E.B.

CURRENT THERAPY—1961. Edited by Howard F. Conn, M.D., with staff of Consulting Editors. 805 pp. W. B. Saunders Company, Philadelphia and London. Price $12.50.

This is a book that is eagerly awaited each year. With the rapid strides in therapy it becomes a *must* for those who would keep abreast of the times in medicine. The roster of Consulting Editors and Contributors is filled with stars in the field of medicine.

R.E.B.

SYSTEMIC LUPUS ERYTHEMATOSUS. By Daniel L. Larson, M.D. 212 pp. Little, Brown and Company, Boston. Price $7.50.

This monograph is based on the study of 200 patients with systemic lupus erythematosus who came under observation at the Presbyterian Hospital in New York City in the past twenty years.

The book contains chapters on special clinical manifestations, special laboratory features, therapy and the clinical course. The author stresses the natural history of this disease which is so variable both in duration and manifestation. The title of "The Great Imitator" could aptly be given to systemic lupus erythematosus. Because this book is based on wide clinical experience and correlated with recent advances in the laboratory techniques and pathological findings, it can be highly recommended as an up-to-date reference in this disease entity.

COL. D. O. LYNN, MC, USA

NON-INFECTIVE DISEASE IN AFRICA. The peculiarities of medical non-infective diseases in the indigenous inhabitants of Africa south of the Sahara. By H. C. Trowell, O.B.E., M.D., F.R.C.P. 481 pp., illustrated. The Williams & Wilkins Co., Baltimore, exclusive U.S. agents. Price $13.00.

This book is the work of an English physician with 29 years clinical experience in East Africa. He visited in other sections of Africa in those years.

Certain of the diseases that are described are common among the Africans but are seldom seen elsewhere. These are, for example, endomyocardial fibrosis, idiopathic cardiomyopathy, siderosis, porphyria, primary carcinoma of the liver, kwashiorkor, and some of the hemoglobinopathies.

The presentation is limited to the non-infective diseases. The author makes no pretense to cover all the field of medicine in his book. What he has covered is extremely interesting as the setting is so different from that to which we are accustomed. At the end of each chapter there are references for further reading should one wish to do so. Many of these references are to African medical journals.

Chapter 10, "The African Milieu Intérieur" contains tables of particular significance in that comparisons are made between diseases occurring in Europeans and Africans, particularly from the standpoint of heredity and blood chemistry.

This well written book is intensely interesting and instructive, particularly for those who will visit in Africa.

R.E.B.

SURGICAL DISEASES OF THE CHEST. Edited by Brian Blades, M.D. 18 contributors. 580 pp., 267 illust. The C. V. Mosby Company, St. Louis. Price $22.00.

This very timely compilation on the surgical management of certain diseases and conditions of the chest provides a very readable, factual, and concise reference for the surgeon, medical practitioner and medical student.

In the last twenty years, thoracic surgery has become a well established specialty in its own right. The rapid strides being made in cardiovascular

surgery permit only the basic fundamentals and concepts to be stressed in a text of this nature. Particular attention has been given to various diseases of the chest amenable to surgical treatment and management, stressing preoperative preparation and postoperative care.

The anatomical and physiological aspects of thoracic surgery are well covered. Chapter 1, Basic Physiology in Thoracic Surgery, by Edward J. Beattie, Jr., M.D. is a striking keynote to the understanding of Thoracic Surgery. Chapters are devoted to Cardiovascular procedures emphasizing their basic diagnostic and technical management. A chapter is devoted to ancillary endoscopic procedures, and likewise one to Anesthesia in Thoracic Surgery.

This is an excellent text which should prove to be of great value to the medical student, surgical resident, medical practitioner and surgeon. Each chapter is followed by an extensive list of suggested references for collateral reading, which the reader will find very helpful.

COL. ALLAN B. EAKER, MC, USA

TRAUMATIC LESIONS OF PERIPHERAL VESSELS. By Colonel Carl W. Hughes, Medical Corps, U. S. Army; and Colonel Warner F. Bowers, Medical Corps, U. S. Army. 197 pp., 58 figs. Charles C Thomas, Publisher, Springfield, Ill. Price $8.00.

Two Army surgeons with extensive experience in vascular surgery have collaborated in the preparation of this fine book. The experience gained in the Korean War particularly is the basis of this work. "Each chapter is a complete unit."

The authors insist that blood vessel repair knowledge is needed by all surgeons and consequently the book has been prepared with that need in mind, although the specialist will want to acquaint himself with the contents of this work.

The authors state: "It is of extreme importance to know what vessels may be interrupted, at what levels they may be tied, the likelihood of extremity loss with ligation at various levels and the usual pathways of collateral or ancillary circulation." That information is available here.

The bibliographies at the end of each chapter are extensive; the illustrations are excellent.

This is a clearly written treatise on the subject, with detail, yet without verbosity. The "know how" of peripheral vascular surgery is here in this book.

RAY BROWN, M.D.

THOUGHT REFORM AND THE PSYCHOLOGY OF TOTALISM. A Study of "Brainwashing" in China. By Robert Jay Lifton, M.D. 510 pp. W. W. Norton and Company, Inc., New York. Price $6.75.

"Brain-washing," or "Szu-hsiang kae-tsao," is described by the author of this thoughtful study as a form of total thought reform whose goal is permanent personality alteration. One can perceive the operation of thought reform in the writings of Mao Tze Tung: "Initially," says the Chinese leader, "give a patient a powerful stimulus; then induce him to believe, through constant reiteration, that he is mentally ill, so that he becomes frightened and feels alone; only then is he susceptible to thought reform."

The author of this stimulating psychiatric study went to Hong Kong, to observe the "brainwashing" phenomenon by interviewing its victims. The author maintained long contact, always with the aid of a translator, with the subjects of his study, enabling him to observe their reactions over the extended period and to analyze such reactions in depth. Dr. Lifton gives us a detailed, comprehensive account of his findings and their implications.

The author demonstrates that the behavior modification involved in thought reform is strong enough to create a profound change in the self-interpretation of thought behavior, values, and sense of reality. The author is to be commended for destroying what he properly terms "lurid mythology" and the web of confusion enmeshing reactions to thought reform. He includes illustrations of victims' "obvious confusion," "apparent conversion," and "apparent resistance," and the predisposing factors involved in each type of response to "brainwashing." He concludes, after presenting some vivid examples, that good resisters are those with a strong sense of identity, which will survive the instillment of guilt and shame.

The great strength of this work lies in the author's considerable research, astute scholarship and dramatic flair, all integrated into a psychological framework resulting in an outstanding example of creative, "off-the-couch," research.

CAPT. JOSEPH CASSIUS, MSC, USAR

SCIENCE IN SPACE. Edited by Lloyd V. Berkner, and Hugh Odishaw, Space Science Board, National Academy of Sciences. 458 pp., illust. McGraw-Hill Book Company, Inc., New York, Toronto, London. Price $7.00.

This timely book presents to the scientific community both an analysis of the achievements of space science and the possible future directions and applications of research in the disciplines concerned with advances in space. The editors, Lloyd Berkner and Hugh Odishaw, are Chairman and Executive Director respectively of the Space Science Board of the National Academy of Sciences. They are joined by eighteen other eminent authorities, including Harold C. Urey, Joshua Lederberg, and James Van Allen, in the documentation of a most impressive demonstration of man's progress into space and of the parameters and problems yet unsolved. The book is also a joint effort of all the members of the Space Science Board.

The book's theme is dealt with in chapters ranging in discussion from the "Nature of Gravitation,"

"Meteorology," the "Sun," the "Moon," the "Planets," "Interplanetary Gas and Magnetic Fields," "Geomagnetically Trapped Corpuscular Radiation," "Galactic and Extragalactic Astronomy," to the "Experimental Approaches to Life Beyond the Earth." The emphasis throughout is on the problems of basic research. Engineering aspects and direct applicability are deemed dependent on the solution of the basic research problems in the various scientific disciplines interested in space.

Until 1957, astronomers were dependent to a great extent on a minute part of the electromagnetic spectrum for their remarkable discoveries. The advances in the state of the art since then has opened many additional research directions. For example, the ability to orbit instrument-laden vehicles has resulted in the opportunity to observe interplanetary phenomena without the interference of the atmosphere of the earth.

The book is aimed primarily at the scientific community at large, as it is the hope of the editors that the solutions of the problems in space research will come from this body. Thus, while the book is at times technical, it is not complex. Each chapter is followed by a very complete bibliography. The book is an excellent source of data and also presents the scope and the nature of the scientific challenge of space. It is of wide interest to those engaged in space research and of particular interest to those engaged in the theoretical aspects of physics, chemistry, astronomy, geology, and the biological sciences.

HARRY WEINRAUCH, M.D.

THE STRUCTURE AND DYNAMICS OF THE HUMAN MIND. By Edoardo Weiss, M.D. 472 pp. Grune & Stratton, New York and London. Price $7.50.

This interesting book summarizes the years of experience of a leading psychoanalyst. The book itself focuses on the theory of psychoanalysis with particular emphasis on ego psychology.

In the presentation there are many examples from clinical material. Also, frequently, the author compares the theoretical positions of various schools of psychoanalysis in order to underline points of convergence or divergence. Generally, the author adheres to the concepts of Federn (who was his analyst and later his friend and colleague) in discussing the central importance of ego theory in the handling of patients.

There are six sections in the book which embrace 49 chapters. Each chapter is closed by a bibliography which includes, at times, explanatory notes. The scope of the book includes clear presentations of mental structure, the ego, the id, the super ego, ego defenses and dreaming.

Ego psychology addresses itself to individual adaptability, adjustment and reality testing. The author includes subjective and objective considerations of ego. Subjectively, the ego relates to feelings of the individual as continuity of body and mind in respect to time and space.

Although the author writes in a very lucid style, the subject matter and concepts he discusses probably make this book most suitable for those who have some psychoanalytic orientation. With that proviso, this book is excellent and will be very useful, informative and stimulating to its readers.

CHESTER M. PIERCE, M.D.

SOME REFLECTIONS ON GENIUS and Other Essays. By Russell Brain. 192 pp. J. B. Lippincott Company, Philadelphia and Montreal. Price $6.00.

In 1869 an epoch making book, *Hereditary Genius,* by Sir Francis Galton was the first real study of exceptional talents and abilities. Galton's approach was statistical. In this book by the eminent English neurologist, Sir Russel Brain, genius is examined from the anatomical, physiological and psychological point of view. He states his belief that the exceptional individual is richer in the number of brain cell functional groups or "schemas" as he designates them. Better memory, increased association delicacy, and possibly larger numbers of both brain cells and functional groups are involved.

Following the opening essay are short biographical studies of some men of genius and superior talents such as Dean Swift, Dr. Samuel Johnson, Lord Monboddo, Charles Dickens and others. In these sketches are included the discussion of a number of interesting questions such as the different types of genius; high ability that stops just short of genius; inspiration and the subconscious mind; and the inheritance of genius and intellectual superiority. It would appear that personality patterns, intellectual and artistic abilities and even personality in relation to moral predilections are transmitted as much as are physical form and character.

The illustrations in the chapter headings, tail pieces and the end papers are a delightful feature. For the physician and biological scientist, and indeed for the intelligent layman, this is a most interesting and informative little book.

CAPT. LOUIS H. RODDIS, MC, USN, Ret.

ORTHOPAEDIA. Translated from the French of Nicolas Andry. A photographic reproduction of the first English edition of 1743. Two vols. Boxed. J. B. Lippincott Company, Philadelphia and Montreal. Price $10.00

Here is a small 2-volume set which should be in the library of every doctor. It is of particular interest to the orthopaedic surgeon because it is a copy of the original work by the originator of the specialty.

This is a perfect facsimile reproduction of the first edition in English published in London in 1743. Great credit is due the Association of Bone

and Joint Surgeons, Dr. Beckett Howorth, Dr. Charles W. Goff, the Yale University Medical Library and Dr. Anthony F. DePalma, to name some of the sources responsible for the reproduction of this very important work.

Nicolas Andry, in his book, planted the seed of a great surgical specialty. This copy of the first English edition contains many basic concepts of the observations of pathologic states of the musculoskeletal systems that have stood the test of time and form the principles of present day orthopaedic surgery.

The work contains fundamental information on such entities as curvature of the spine, club feet, congenital dislocations including the hip, bow legs and congenital deformities. He was the first to note active participation of muscles in producing deformities of the skeletal system. He devised many types of splints. As Dr. DePalma states, it is hoped that this replica of the English edition of "L'Orthopedie" will make us cognizant of the gratitude that we as orthopaedic surgeons owe him.

This reproduction by Lippincott & Company indeed is something which I am sure, all of us would like to own.

W. Compere Basom, M.D.

Management of Hypertensive Disease. By Joseph C. Edwards, A.M., M.D., F.A.C.P., F.A.C.C. With Foreword by Paul Dudley White, M.D. 439 pp., illust. The C. V. Mosby Co., St. Louis. Price $15.00.

It is a monumental task for a single author to write a book in a fluid and rapidly developing field like hypertension, and have the book current in all facets at the date of publication. Dr. Edwards has accomplished this. Today, six months after publication, it is difficult to find a point not currently correct.

The prime value of such a book, however, is to collect, culminate, and criticize past and present concepts. I believe this book performs this function superbly. A bibliography of 1622 references suggests the completeness of the survey.

The broad aspects are well covered in detailed, readable fashion: diagnosis, complications, natural history, management, antihypertensive drugs.

The chapter on "Special Types" discusses beautifully the surgically curable diseases such as coarctation, aldosteronism, pheochromcytoma, unilateral renal disease, and, remarkably enough, a description of primary pulmonary hypertension.

This book is a "must" for libraries, and a "should" for cardiologists and internists. As source material for lectures it will be invaluable to teachers.

To review a book in glowing terms is a trite custom today; however, this reviewer is at loss to produce constructive criticism of Dr. Edwards' book.

Lt. Col. R. B. Franklin, MC, USA

Intra-Abdominal Crises. By Kenneth D. Keele, M.D., F.R.C.P.; and Norman M. Matheson, F.R.C.S., M.R.C.P., F.A.C.S. 397 pp. Butterworth, Washington, D.C. Price $10.00.

The clinical syndrome of abdominal pain and vomiting may truly be said to cast its shadow upon all the disciplines of medicine. General practitioners, pediatricians, internists, surgeons, obstetricians, gynecologists, neurologists, urologists, allergists, dermatologists and psychiatrists alike must accept the problem as their own. Often, nonetheless, such a patient is quickly diagnosed as having a "surgical belly" whereupon he is relegated to the surgical side of the house where he undergoes an operation unless the surgeon declines or his extra-abdominal disease reaches clinical notice. If a generality is appropriate, it is that the physician is uncomfortable with a surgical crisis, the surgeon is uncomfortable with a medical crisis and the patient is uncomfortable with both.

This small book should be a balm to all. A physician and a surgeon have collaborated to present a concise analysis and discussion of abdominal crises. The symptoms of abdominal pain, vomiting and related manifestations are scrutinized from their moment of onset, when the patient himself must determine whether a crisis is at hand, on through the stages of medical care; including the relative or friend, the general practitioner, the ambulance team, the hospital admitting room, the treatment floor and the various consultants who may be called in. The clinical manifestations of acute abdominal disease are systemically related to anatomic and pathophysiologic factors. Intermingled with the correlative analyses are clinical notes derived from the authors' extensive personal experience. Reference is made to the "restlessness of colic" and the "stillness of peritonitis." Christmastime is indicated as the most dangerous of the festive seasons, for cogent reasons. One is admonished to give heed to the inarticulate relative or friend of the patient who can only say that the patient "looks different." And one is reminded that flexion of the hips with drawing up of the knees, while it may be due to peritonitis with psoas muscle irritation, may also be due to hip disease.

An excellent discussion of physical signs is followed by a section on the important subject of diagnostic exclusion of diseases simulating intra-abdominal crises.

The large middle portion of the book is devoted to individual consideration of a variety of local abdominal diseases. Brevity is the keynote throughout, but essential information and comment are provided in full measure. Several omissions may be noted. The authors apparently do not perform diagnostic abdominal paracenteses. Also, the discussion of hematemesis makes no reference to the more aggressive diagnostic approach which utilizes gastric cooling, peroral endoscopy and barium

study of the upper gastrointestinal tract of such patients immediately following hospital admission. The Mallory-Weiss syndrome is not mentioned as a cause of hematemesis and as a possible argument against blind gastric resection for upper gastrointestinal bleeding.

The importance of recognizing "spurious" hematemesis (blood which originates outside the gastrointestinal tract but is swallowed before being vomited) is appropriately emphasized. The final portion of the book deals with intra-abdominal crises as part of general disease and includes endocrine-metabolic, hepatobiliary, gastroenteritic, enterocolitic and tropical considerations.

The book is well done. The text is easy to read and is appropriately illustrated. The authors are to be complimented for getting so much useful information into a volume of this size. The few typographical errors and rare grammatical oversights in no way detract from the pleasure of reading it. It is freely recommended for clinicians in all fields, from the physical diagnosis class of the sophomore year, where it ought to be required reading . . . on.

VERNON M. SMITH, M.D.

AN INTRODUCTION TO FUNCTIONAL HISTOLOGY. 2nd Ed. By Geoffrey H. Bourne, M.SC., D.Sc., D.Phil. 263 pp., 181 illust. Little, Brown and Company, Boston. Price $8.00.

As the title suggests, the author's purpose is to present the functional and dynamic aspect of a subject that is too often considered to be one of static morphology. Current biochemical and histochemical data as well as technical details of special tissue section preparations are presented. In addition to describing a few special procedures such as demonstration of goblet cells, sulfhydryl groups and phospholipids, the author gives methods for tissue aldehydes, enzymes and vitamins. He also includes a short discussion on autoradiography for the demonstration of radioactive iodine, calcium, phosphorus and sulfur in tissue sections.

There are three main chapters, entitled (1) Cells, (2) Tissues, (3) Organs. The first chapter is especially detailed and complete. Sections in the third chapter relating to the liver and kidney are particularly well done with concise text and several graphic illustrations which greatly aid the correlation of histology with physiology.

As the author notes in his preface, this book is not meant to be a complete textbook of histology. It is intended to be a supplement to standard texts and to inject the concept of the living cell into the study of histology.

This new edition would seem to serve best as a supplementary reading source for graduate students in the biological sciences, especially those in biochemisty. Medical students will find it quite useful in helping to correlate structure with function of cells, tissues and organs. Also, it is a source of several special staining technics that are not ordinarily included in the widely used manuals or texts of histologic technic.

ROBERT F. DILLON, M.D.

ANATOMY AND PHYSIOLOGY. Applied to Nursing. By Janet T. E. Riddle, R.G.N., R.F.N., O.N.C. Illustrations by Kathleen B. Nicoll, R.G.N., S.C.M., O.N.C. 128 pp., illust. The Williams & Wilkins Co., Baltimore, exclusive U.S. agents. Price $3.50.

In this brief, well illustrated book, the author has presented a simple overall picture of the human body for first year nursing students preparing for British State Enrollment. The content is presented in a very elementary manner and is more in keeping with our secondary school biology texts. It is intended that the knowledge gained will be applied to the nursing arts in caring for patients. A comparison is made of the human body to a delicate machine, and the related parts are so described. Since a professional nurse today should be familiar with the medical technical language and more detail, this book is considered in many aspects more suited for practical nurses and aides. Instructors of anatomy and physiology would find this book of value in teaching the "slow student," or teaching classes to high school students. The black and white illustrations are exceptionally well done. There are helpful visual aids, particularly those in the chapter "Posture—Nurse and Patient."

LT. COL. EVELYN M. BEDARD, USAF, NC

QUAESTIONARIUM MEDICUM. Edited by Professor Jean Herbert, Former Chief Interpreter, United Nations. D. Van Nostrand Company, Inc., Princeton, Toronto, London. Price $6.00.

This is a pocket size book intended to assist those in the medical and its allied fields in the communication with patients who speak other languages.

There are 475 questions identically numbered in the 17 languages, each having its separate section of the book. There are 12 European languages besides the English; then there is Japanese, Chinese, Malay, and Esperanto.

This small book should have a world wide appeal.

R.E.B.

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To The Association of Military Surgeons of the United States
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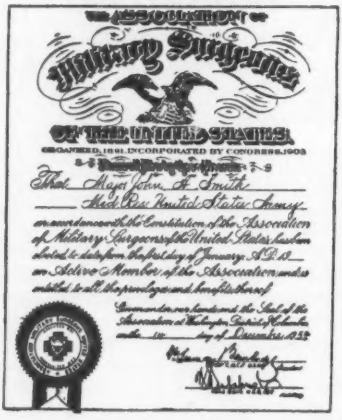

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